Appendix A. Lands

A.1 Introduction

This appendix includes information about refuge establishment authorities, acquisition history, refuge purposes, and land status for Protection Island and San Juan Islands Refuges. It documents research that was done early in the planning process. Findings from many sources are summarized in this appendix. Research included the following:

- The Service's national refuge purposes database was consulted.
- The Service's Land Record System was reviewed.
- Realty hardcopy files were searched extensively.
- The Tract Record spreadsheet prepared by the GIS branch was consulted.
- Additional documents related to the establishment history of the San Juan Islands NWR which were not found in the Service's files were obtained from Bonneville Power Administration Library in Portland, Oregon, and from the DOI national library.

This appendix also includes information about navigation aids that are on or near refuge lands, and a section on habitat protection needs.

Protection Island National Wildlife Refuge

Refuge Establishment and Purposes (*purposes are bold and italicized*)

Refuge establishment was authorized by the Protection Island National Wildlife Refuge Act, Public Law 97 – 333, Oct 15, 1982 (96 Stat. 1623). "***The purposes of the refuge are to provide habitat for a broad diversity of bird species, with particular emphasis on protecting the nesting habitat of the bald eagle, tufted puffin, rhinoceros auklet, pigeon guillemot, and pelagic cormorant; to protect the hauling-out area of harbor seals; and to provide for scientific research and wildlife-oriented public education and interpretation*** (96 Stat. 1623)" and apply to all portions of Protection Island NWR. The first 1.42 acres of the refuge were donated by Admiralty Audubon Society ".... ***in accordance with Public law 97-333 (96 Stat. 1623) Protection Island National Wildlife Refuge Act*** (Donation Warranty Deed, December 22, 1982)." Most of the over 800 tracts that make up the refuge were authorized by the same act and purchased from 1983-1987 with funds authorized by the Land and Water Conservation Fund Act of 1965, as amended. Purposes of this fund include ***acquisition of "(d) any areas authorized for the National Wildlife Refuge System by specific Acts*** (16 U.S.C. 460l-9). The Service also has a 20-year, aquatic lands lease for the second class tidelands around Protection Island (No 20-013245) from Washington Department of Natural Resources (WDNR). This lease is authorized by the Fish and Wildlife Act of 1956, ***". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources*** . . ."
(16 U.S.C.742 f(a)(4)). Also see Table A.1.

Table A.1. Protection Island Acquisition History and Land Status Summary

Date acquired	# of tracts	Interest Acquisition	authority	Funding authority
12/22/82	6	Fee	Public law 97-333	donation
6/20/83	1	Fee	Public law 97-333	Land and Water Conservation Fund (LWCF)
7/25/83	4	Fee	Public law 97-333	LWCF
8/10/83	1	Fee	Public law 97-333	LWCF
8/19/83	1	Fee	Public law 97-333	LWCF
9/8/83	1	Fee	Public law 97-333	LWCF
9/19/83	1	Fee	Public law 97-333	LWCF
1/17/85	1	Fee	Public law 97-333	LWCF
4/12/85	10	Fee	Public law 97-333	LWCF
4/18/85	15	Fee	Public law 97-333	LWCF
4/19/85	12	Fee	Public law 97-333	LWCF
4/26/85	4	Fee	Public law 97-333	LWCF
4/29/85	5	Fee	Public law 97-333	LWCF
5/6/85	4	Fee	Public law 97-333	LWCF
5/7/85	2	Fee	Public law 97-333	LWCF
5/8/85	4	Fee	Public law 97-333	LWCF
5/10/85	7	Fee	Public law 97-333	LWCF
5/13/85	11	Fee	Public law 97-333	LWCF
5/14/85	2	Fee	Public law 97-333	LWCF
5/15/85	9	Fee	Public law 97-333	LWCF
5/17/85	11	Fee	Public law 97-333	LWCF
5/20/85	4	Fee	Public law 97-333	LWCF
5/21/85	7	Fee	Public law 97-333	LWCF

Date acquired	# of tracts	Interest Acquisition	authority	Funding authority
5/22/85	4	Fee	Public law 97-333	LWCF
5/24/85	7	Fee	Public law 97-333	LWCF
5/28/85	11	Fee	Public law 97-333	LWCF
5/29/85	8	Fee	Public law 97-333	LWCF
5/30/85	6	Fee	Public law 97-333	LWCF
5/31/85	4	Fee	Public law 97-333	LWCF
6/4/85	4	Fee	Public law 97-333	LWCF
6/7/85	1	Fee	Public law 97-333	LWCF
6/13/85	2	Fee	Public law 97-333	LWCF
6/18/85	11	Fee	Public law 97-333	LWCF
6/25/85	2	Fee	Public law 97-333	LWCF
6/26/85	1	Fee	Public law 97-333	LWCF
7/15/85	2	Fee	Public law 97-333	LWCF
7/19/85	4	Fee	Public law 97-333	LWCF
7/30/85	3	Fee	Public law 97-333	LWCF
8/13/85	1	Fee	Public law 97-333	LWCF
8/26/85	2	Fee	Public law 97-333	LWCF
9/30/85	2	Fee	Public law 97-333	LWCF
1/13/86	4	Fee	Public law 97-333	LWCF
1/15/86	2	Fee	Public law 97-333	LWCF
1/21/86	4	Fee	Public law 97-333	LWCF
1/23/86	2	Fee	Public law 97-333	LWCF
2/11/86	3	Fee	Public law 97-333	LWCF
2/13/86	2	Fee	Public law 97-333	LWCF
4/3/86	2	Fee	Public law 97-333	LWCF
4/11/86	616	Fee	Public law 97-333	LWCF
4/22/86	2	Fee	Public law 97-333	LWCF
4/25/86	3	Fee	Public law 97-333	LWCF
5/28/86	1	Fee	Public law 97-333	LWCF
6/2/87	1	Fee	Public law 97-333	LWCF
1/12/93 1		Lease from Washington State (No. 20-013245 expires Dec. 31, 2013)	Fish and Wildlife Act of 1956	Donation

Sources: Excel tract report by GIS branch, Land Record System, Georgia Shirilla verified acquisition and funding authorities on 2/27/07.

Land Status

Protection Island NWR is entirely on an island by the same name in Jefferson County, Washington. There are 316 acres of fee title lands within the refuge and an additional 340-acre aquatic lands lease from WDNR. The refuge establishment date is reported as December 22, 1982, concurrent with a donation to the Service of the first 1.42 acres by Admiralty Audubon Society. As of June 2, 1987, all lands identified as within the Protection Island NWR boundary have been acquired.

Aquatic Lands
The 340-acre tideland lease is due to expire on December 31, 2013. There is also a bedland reservation and withdrawal "from conflicting uses for an indefinite term from November 22, 1988" of " . . . the bedlands of navigable water owned by the state of Washington, surrounding Protection Island extending waterward 600 feet from the line of extreme low water . . .(WDNR 1988, Withdrawal Order 88 017)." This withdrawal order further states that public access may be permitted under conditions mutually agreed upon by the DNR and DOI. The Service has maintained both the lease area and the withdrawal area as closed to the public to protect refuge wildlife.

Zella M. Schultz Seabird Sanctuary
Protection Island NWR boundary does not include 48-acres on the west end of the island known as the Zella M. Schultz Seabird Sanctuary, which was protected prior to refuge establishment first through purchase by The Nature Conservancy in 1972, then by Washington Department of Game (now WDFW) acquisition in 1974. This sanctuary bisects the rhinoceros auklet colony. There is an MOU between the Service and WDFW for cooperation between the two agency owners and managers of Protection Island.

Protection Island Extended Users
A number of people with interest in tracts of land on Protection Island prior to establishment of the NWR were given extended use of the tracts and access to Protection Island under a variety of terms. Many of these terms have already expired and most of the rest will expire in 2011. All current extended users have unimproved lots that receive occasional use with the exception of one lifetime user who has a residence on the island. See Table A.2 for additional information.

Extended users reserved a number of rights when the refuge was established. These include the right to use their lots for picnicking and overnight camping; the right for pedestrian (or motor vehicle use for lifetime user) use of a road system designated by the United States; the right to use, without expense, water of the same quality as presently available from the existing water system, from a central source designated by the United States; the right to use the existing marina and associated facilities for entry/exit and boat moorage subject to the right of the United States to provide equivalent substitute facilities; the right to fish and crab from the dock and from boats in a portion of the marina and the right to walk the beach in designated areas from October through February.

The use of the lot and designated island facilities is limited to the immediate family of the reservation holder. In addition personal guests may be allowed to use the reserved premises and designated island facilities only when the reservation holder is present. The only lifetime user has the additional right to maintain the grounds, have a dog on the premises, to have gardens, and to store firewood on the lot.

Table A.2. Protection Island NWR Extended Users

Tract #	Acre	Term of Use
1241	.26	25 years expires 2011
2042	.21	25 years expires 2011
2069	.26 with home	life use
2101	.21	25 years expires 2011 25 years expires 2011 25 years expires 2011 25 years expires 2011
2170	.29	25 years expires 2011

San Juan Islands National Wildlife Refuge

Refuge Establishment and Purposes (*purposes are bold and italicized*)

San Juan Islands NWR was first established in 1960 to be ***". . . reserved under jurisdiction of the Bureau of Sport Fisheries and Wildlife, United States Fish and Wildlife Service. . ."*** (PLO 2249). In 1975 the San Juan Islands NWR was consolidated with Smith Island NWR (est. 1914), Matia Island NWR (est. 1937) and Jones Island NWR (est. 1937) and additional lands were reserved under the name of San Juan Islands NWR (PLO 5515). PLO 5515 does not state a purpose for this newly consolidated refuge but an earlier proposal published in 38 FR 29831 on Oct 29, 1973, stated it was to ***". . .facilitate the management of migratory birds for which the United States has a responsibility under international treaties and to further effectuate the purposes of the Migratory Bird Conservation Act."*** Smith and Minor Islands also retain their original establishing purpose from E.O. 1959 ***"as a preserve, breeding ground and winter sanctuary for native birds."*** In October of 1976 the San Juan Islands Wilderness was established (P.L. 94-557), which added the purposes of the Wilderness Act (P.L. 88-577, Sept. 3, 1964) including ***". . .to secure for the American people of present and future generations the benefits of an enduring resource of wilderness"*** to all units of the refuge except for Smith, Minor, Turn, Jones Islands, and a small portion of Matia Island. Under P.L. 97-333 (1982) and PLO 6489 (1983) Jones Island was removed from the San Juan Islands NWR and transferred to the State of Washington for use as a public recreation area. Under executive orders since the mid- to late-1800s and in the refuge establishing documents it was stated that some islands which are now units of the San Juan Islands NWR retain ***"lighthouse purposes."*** These "lighthouse purposes" today translate into a variety of navigation aids which are maintained under the jurisdiction of the U.S. Coast Guard. Also see Table A.3.

Table A.3. San Juan Islands NWR Establishment Authorities, Acquisition History, and Refuge Purposes.

Date	Legal document	Refuge Lands	Relevant action and refuge purposes (*bold and italicized*)
9/11/1854	Order	Smith Island Minor Island	Reserved certain islands for ***lighthouse purposes***.
7/15/1875	E.O. (un-numbered series)	Matia Island Puffin Island Sister's Is. N Peapod Is. Turn Island Jones Island Flattop Is. Skipjack Is.	Reserved 23 tracts of land in the waters north of Puget Sound for ***lighthouse purposes.***
6/6/1914	E.O. 1959	Smith Island Minor Island	Reserved Smith and Minor Islands for use of the USDA ***"as a preserve, breeding ground and winter sanctuary for native birds."*** The reserve to be known as Smith Island Reservation (65 ac). ***"This order is not intended to abrogate the order of September 11, 1854, reserving these islands for lighthouse purposes, . . . in addition to such use, shall insure the protection of the native birds thereon."***

Date	Legal document	Refuge Lands	Relevant action and refuge purposes (*bold and italicized*)
3/30/1937 4/2/1937	E.O. 7594 2 FR 739	Jones Island	Established Jones Island Migratory Bird Refuge, 179.07 ac in San Juan county.
3/30/1937 4/2/ 1937	E.O. 7595 2 FR 741	Matia Island	Reserved Matia Island and established Matia Island Migratory Bird Refuge ***". . . as a refuge and breeding ground for migratory birds and other wildlife." "The Executive order of July 15, 1875, reserving certain public lands for lighthouse purposes, is hereby revoked in so far as it applies to the above-described land.*** Matia Island is 145 ac in San Juan County.
7/25/1940 7/30/1940	Proc. 2416 5 FR 147	Jones Island Matia Island Smith Island Minor Island	Changed the names of various reserves and migratory bird refuges to National Wildlife Refuges.
12/24/1960 1/10/1961	PLO 2249 26 FR 165	Williamson Rocks Colville Is. Bird Rocks Turn Island Bare Island Jones Island	Established San Juan Islands NWR 1960 to ***be ". . . reserved under jurisdiction of the Bureau of Sport Fisheries and Wildlife, United States Fish and Wildlife Service. . ."*** for a total of 52 acres in San Juan and Skagit Counties. Added 9.02 acres to Jones Island NWR for a total of 188.09 in San Juan County. ***Partly revoked Executive Order of July 15, 1875 reserving certain lands for lighthouse purposes, as far as they affect Turn Island and Jones Island.***
1/6/67 1/12/1967	PLO 4148 32 FR 320	Buck Island	Added Buck Island (1ac) to San Juan Islands NWR.
7/3/1969	Letter	Puffin Is.	Travis S. Roberts, Acting Regional Director, requested concurrence from U.S. Coast Guard on FWS secondary withdrawal for wildlife management of Puffin Island ***". . . to insure protection and maintenance of natural nesting habitat for numerous sea birds.*** The only development proposed is posting the island as a National Wildlife Refuge, ***no public use will be permitted during the nesting season."***
11/6/1969	43 FR 17972	Puffin Island	Notice of Proposed withdrawal of Puffin Island " as an addition to Matia Island National Wildlife Refuge ***for the management of migratory birds and other wildlife."***
9/3/1970	PLO 4889 35 FR 14317	Puffin Island	Added Puffin Island, 10 ac (tract 1a) to Matia Island NWR, secondary to U.S. Coast Guard jurisdiction for lighthouse purposes.

Date	Legal document	Refuge Lands	Relevant action and refuge purposes (*bold and italicized*)
10/18/1973 10/19/1973	Notice 38 FR 29831	All units	Proposed withdrawal of lands and consolidation of national wildlife refuges into the San Juan Islands National Wildlife Refuge which will ***". . .facilitate the management of migratory birds for which the United States has a responsibility under international treaties and to further effectuate the purposes of the Migratory Bird Conservation Act."***
8/27/1975 9/4/1975	PLO 5515 40 FR 40811	All units	Reserved lands for the San Juan Islands NWR 388.32 acres in Island, San Juan, Skagit, and Whatcom Counties. Revoked EOs 1959, 7594, 7595, PLO's 2249 and 4148 and 4889 insofar as they affect any of the islands described in this PLO but does not alter jurisdiction for ***lighthouse purposes*** provided for by EO of July 15, 1975.
7/22/1976 7/29/1976	PLO 5594 41 FR 31535		Corrected PLO 5515 to delete all reference to EO 1959 and PLO 2249. Amended PLO 5515 to include an additional 69.5 acres of San Juan County islands in the San Juan Islands NWR. Total Refuge acres 457.82
10/19/1976	P.L. 94-557	All units except Smith, Minor, Turn, Jones, and part of Matia	***Designates as wilderness:*** "(p) certain lands in the San Juan Islands National Wildlife Refuge, Washington, which comprises approximately three hundred and fifty five acres, which are depicted on a map entitled "San Juan Islands Wilderness Proposal", dated August 1971 (revised July 1976), and which shall be known as the San Juan Wilderness."
10/15/1982	P.L. 97-333 (96 Stat 1623)	Jones Island	In consideration of the prior transfer of certain properties now in the San Juan NWR by Washington State Parks and Recreation Commission to DOI, transfers ownership, jurisdiction, and control of Jones Island NWR to the State of Washington for use as a public recreation area.
10/14/1983 10/24/1983	PLO 6483 48 FR 49022	Dot Island	Eliminated Dot Island from SJNWR by correcting the land description in PLO 5515 to delete No. 67, Dot Island, which consists of one large island with a small islet immediately to the southwest.
10/27/1983 11/4/1983	PLO 6489 48 FR 50895	Jones Island	Revoked executive order 7594 and in part PLO 2249 which had established and added to Jones Island NWR.

Land Status

The San Juan Islands NWR consists of mostly small islands, islets, rocks, and reefs scattered across a large area in Puget Sound. Refuge units are located in four Washington State counties: Island, San Juan, Skagit, and Whatcom. As far as we can tell, all units currently within the San Juan NWR were always under federal ownership ever since they became part of the United States. The Service has primary interest on all refuge

units except for those withdrawn for lighthouse purposes prior to refuge establishment. In those cases the Service is presumably secondary to the U.S. Coast Guard who maintains navigation aids on these islands. An estimated nineteen of the 83 refuge units have navigation aids, however, we do not have a record of when each of the navigation aids was authorized and therefore we cannot determine if we are primary or secondary in all cases. Also see Table A.4. Determining acreage of small islands above the mean high tide is inherently difficult. Total refuge acreage is reported as 448.53 and wilderness acres as 353.0 in the Annual Report of Lands Under the Control of the USFWS (2008).

United States Coast Guard Navigation Aids

The U.S. Coast Guard (USCG) operates and maintains a number of aids to navigation structures on or immediately adjacent to refuge islands in the San Juan Islands and Protection Island (see Table A.4). Nineteen of these are covered under a 2005/2006 Memorandum of Understanding between the Service and the USCG.

Table A.4 USCG Navigation Aids on or immediately adjacent to San Juan Islands NWR and Protection Island NWR.

FWS #	Navigation Aid Name	LLNR[1]	Position	Year Established	Original Authority[2]
6	Boulder Reef Lighted Bell Buoy "2"	19500	48 38 17N 122 41 42W		
7	Davidson Rock Light "1"	19325	48 24 48 N 122 48 43 W	1933	EO 1875, tidal zone
24	Harbor Rock	19680	48 28 18 N 122 58 23 W		
25	North Pacific Rock[3]				
29	Pole Pass Light "2"	19655	48 36 06N 122 59 24W		
33	Center Island Reef Daybeacon	19385	48 29 04N 122 50 11W		
39	Flattop Island[4]			EO	1875
42	Skipjack Island Light	19805	48 43 58 N 123 02 21 W	1933 EO	1875
44	Clements Reef Danger Buoy	19860	48 45 46N 122 52 07W		
46	Parker Reef Light	19840	48 43 33 N 122 53 40 W	1957 tid	al zone
47	The Sisters Light "17"	19515	48 41 40 N 122 45 25 W	1972 EO	1875
49	Wasp Passage Light "5"	19660	48 35 71 N 122 58 60 W	1948 tid	al zone
52	Turn Rock Light "3"	19590	48 32 06 N 122 57 54 W	1957	EO 1875?, tidal zone
53	Shag Rock Daybeacon	19445	48 35 30 N 122 52 31 W	1959 tid	al zone
56	Lawson Rock Danger Daybeacon	19410	48 31 48N 122 47 18W	1937 tid	al zone
58	Black Rock Light "9"	19455	48 32 45 N 122 45 57 W	1960 tid	al zone
59	Peavine Pass Rocks Daybeacon	19460	48 35 19 N 122 48 04 W	1960 tid	al zone
64	Peapod Rocks Light "15"	19490	48 38 32 N 122 44 37 W	1933 EO	1875?
65	Eliza Rocks Junction Light	19215	48 38 60 N 122 34 70 W	1940	
66	Viti Rocks Light	19200	48 38 00 N 122 37 22 W	1939	
66	Viti Rocks Lighted Bell Buoy "9"	19205	48 37 48 N 122 37 08 W		

FWS #	Navigation Aid Name	LLNR[1]	Position	Year Established	Original Authority[2]
68	Bird Rocks Light	19645	48 35 52 N 123 00 53 W	1958	
75	Smith Island Light	16375	48 19 06 N 122 50 38 W	1961 EO	1854
76	Minor Island Light	16380	48 19 27 N 122 49 09 W	1931 EO	1854
78	Puffin Island Shoal Light "19"	19530	48 44 36 N 122 49 00 W	1933 EO	1875
80	Belle Rock Sector Light	19395	48 29 35 N 122 45 10 W		
81	Williamson Rocks Lighted Gong Buoy "4"	19335	48 26 50 N 122 42 25 W		
NA	Protection Island Southwest Spit Buoy "1"	16460	48 06 52N 122 57 54W		

[1] USCG Light List Number
[2] According to the USCG, special authority is not needed to establish a navigation aid in tidal areas.
[3] There are no navigation aids at this location, however, this location is included in the 2005/2006 MOU between the Service and the USCG.
[4] There are no navigation aids at this location, however, the authority for one was included in E.O. 1875 which to our knowledge has not been revoked.

Habitat Protection Needs

Some habitat protection needs have already been identified in Chapter 2 of the CCP. These include extending refuge law enforcement authority to WDFW lands on Protection Island and working with WDNR and other partners to enhance buffers around refuge islands. These actions are needed to prevent habitat damage and reduce human-caused wildlife disturbance. The Service is also participating in meetings and plans are underway for establishment of aquatic reserves that would include the waters around Protection Island and around Smith/Minor Islands.

Additional habitat protection above and beyond that identified in Chapter 2 of this CCP is needed to ensure the long-term viability of wildlife associated with Protection Island and the San Juan Islands NWRs in the face of climate change and human population growth.

The future condition of refuge shorelines is anticipated to be adversely affected by sea level rise associated with climate change. Likely effects due to sea level rise and other climate-related factors include increased inundation, erosion, and overwash during storm events, leading to losses of shoreline habitats (Mote et al. 2008, Huppert et al. 2009). Habitat specialists, such as black oystercatchers, face increased threats from climate change since they have a very restricted range during the breeding season. Oystercatchers, marine mammals, terns, and gulls are particularly vulnerable to loss of habitat and reproductive failure due to sea level rise because they typically nest on low-laying spits or sandy shorelines. Identification and protection of alternative shorelines would help protect these species. Habitats of interest would include spits, sandy, or rocky shoreline.

Due to the scarcity of small islands suitable for nesting seabirds and other marine wildlife, their protection is warranted whenever possible. If other islands within the Salish Sea become available, they would be evaluated for their conservation potential and considered for inclusion into the Refuge System or another form of habitat protection.

Appendix B. Rocks, Reefs, and Islands within San Juan Islands National Wildlife Refuge

B. Introduction

This appendix provides information on the locations, habitat types, wildlife, wilderness status, and physical attributes of the various rocks, reefs, and islands contained within San Juan Islands National Wildlife Refuge. Aerial photographs provide an additional identification aid. The numbering system of the 83 rocks, reefs, and islands contained within the refuge was first established in the San Juan Islands Wilderness Proposal of August 28, 1971, and has been retained and used in several subsequent publications and research databases. All units of the refuge lie within the San Juan archipelago, with the exception of Smith and Minor Islands, which are located approximately seven miles south of Lopez Island. Because of the limited availability of the habitat preserved and the intent to provide an undisturbed haven for wildlife, all but Turn and Matia Islands are closed to public use. The San Juan Islands Wilderness was established on October 19, 1976, by public law 94-577. All the islands within the refuge, except for Smith, Minor, Turn, and five acres of Matia Island, are designated wilderness.

The information within this appendix was gathered from several sources and has been narrowed to provide a few of the most vital statistics. Physical descriptions of the islands were obtained from the San Juan Islands Wilderness Proposal of August 28, 1971. Data pertaining to wildlife species, plant species, and overall habitat types found on the islands were collected through a series of surveys conducted by refuge staff between 2000 and 2009. Observations collected by the Whale Museum's Soundwatch program in 1997 were also consulted on these topics. Latitude and longitude coordinates and island acreages were provided by the Region 1 Realty and Information Branch of the USFWS. Information on navigational aids was compiled from the U.S. Coast Guard 13th District Management Branch 2009 Aid Assignment List and verified using National Oceanic and Atmospheric Administration Electronic Navigational Charts from 2008-2009 and the observations of refuge staff. Although much of the provided information is dynamic and may fluctuate with time, this document was compiled to provide a brief reference to the resources managed within the refuge.

01. Small Island — 48° 29' 43" N, 122° 51' 48" W

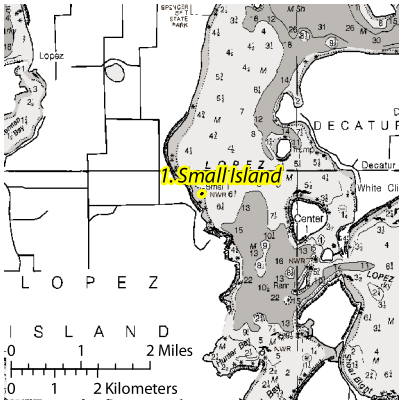
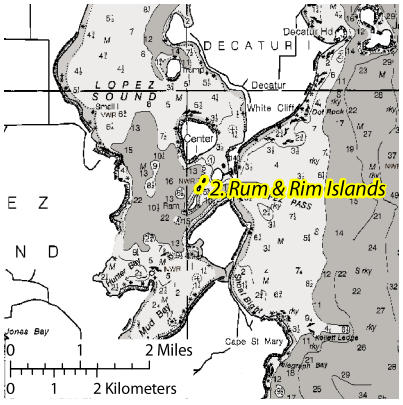


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a very low, flat, rocky 0.329 acre wilderness island approximately 200 to 300 yards offshore of Lopez Island. The habitat structure primarily consists of consolidated rock with very sparse vegetation bordered by a sandy and gravelly shoreline. Wildlife present on this island in 2009 included swallows, black turnstones, black oystercatchers, and double-crested cormorant. Wildlife with young present on the island in 2009 included harbor seals and glaucous-winged gulls. From 2000-2004 black oystercatchers, double crested cormorants, and harbor seals were recorded here.

02. Rum and Rim Islands — 48° 28' 49" N, 122° 49' 44" W



Rum Island — Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

These are the northern two islands in the Ram Island group, which is located near the west entrance to Lopez Pass. The northernmost island, Rim Island, has a low-profile. The second island, Rum Island, is separated from the first by about 50 yards of water, although they may be connected by a submerged reef. Together they total 1.777 acres. Rum and Rim Islands are designated wilderness. The third island in the group is privately owned. Habitat consists of rocky shoreline surrounding an herbaceous bald interior. Tree species occurring in a limited woodland on Rum Island include Garry oak, madrone, and Douglas fir. Wildlife present on the islands in 2009 included pelagic cormorant, harbor seals, and black oystercatchers. Between 2000 and 2004 black oystercatchers and harbor seals were present on these islands

03. Fortress Island — 48° 27' 55" N, 122° 50' 18" W

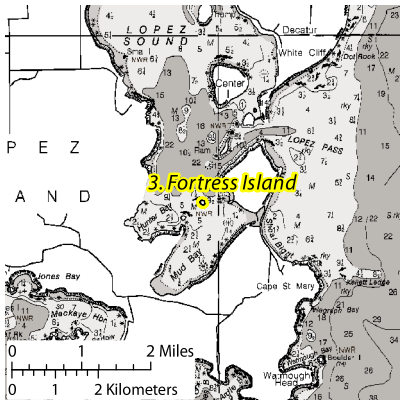


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This somewhat dome-shaped wilderness island located in Lopez Sound about a half mile to the northeast of Crab Rocks is 2.324 acres. It rises to an elevation of about 100 feet above sea level, has precipitous slopes on all sides, and is surrounded by deep water. The habitat structure is mainly rocky shoreline and herbaceous bald. Willow, wild rose, ocean-spray, snowberry, reindeer moss, stonecrop, and prickly pear cactus have been recorded on this island. In 2009 no wildlife were observed on this island. However harbor seals were found here between 2000 and 2004.

04. Skull Island — 48° 27' 57" N, 122° 49' 59" W

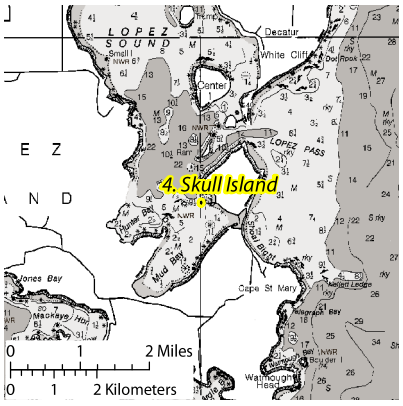


Photo by USFWS (2003)

Photo by WA Dept. of Ecology (2006)

Skull Island is a low profile wilderness island about 200 yards off Lopez Island and 300 yards to the northeast of Fortress Island. It is 0.194 acres in size. The habitat consists of rocky shoreline with some grasses and sedum. Wildlife present on the island in 2009 included harbor seals and great blue heron. In 2000 through 2004 black oystercatchers and harbor seals were present.

05. Crab Island — 48° 27' 43" N, 122° 50' 40" W

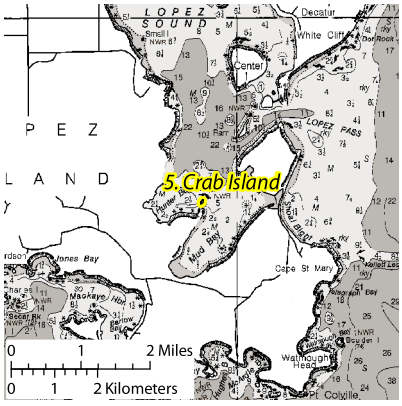


Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Natural Resources (2004)

Crab Island is a very low and rocky wilderness island extending just a few feet above water. It is 0.717 acres in size and separated from Lopez Island by about 100 yards of deep water. The habitat structure is primarily rocky shoreline excepting areas where pockets of soil enable the limited growth of gumweed and some grasses. In 2009 wildlife surveys found double-crested cormorant, great blue heron, and glaucous-winged gulls. Wildlife with young in 2009 included harbor seals and black oystercatchers. Harbor seals and black oystercatchers were recorded in surveys between 2000 and 2004.

06. Boulder Island — 48° 25' 57" N, 122° 48' 7" W

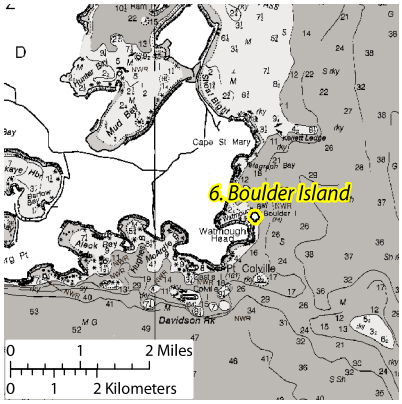


Photo by WA Dept. of Ecology (2006)

Photo by Khem So/USFWS (2007)

This wilderness island is a circular, dome-shaped island, with a narrow, rocky point projecting from its south end. A small, gravelly pocket beach exists adjacent to the narrow rocky point. It is located at the south entrance to Watmough Bay, separated from Lopez Island by about 100 yards of deep water, and is 6.558 acres. Its habitat structure is made up of rocky shoreline, sandy and gravelly shoreline, and herbaceous bald. Some scattered Douglas fir occur, mixed with wild rose, oceanspray, gumweed, yarrow, goose tongue, sea thrift, and grasses. Glaucous-winged gulls were present on Boulder Island in 2009. From 2000 to 2004 glaucous-winged gulls, harbor seals, and pigeon guillemots were present.

07. Davidson Rock — 48° 24' 48" N, 122° 48' 43" W

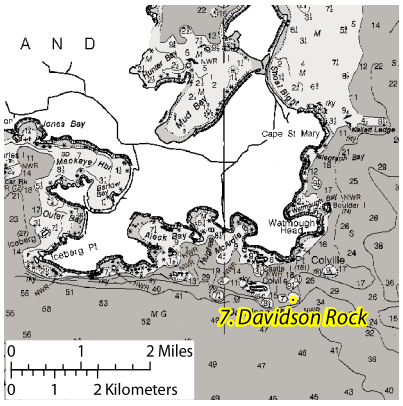


Photo by Khem So/USFWS (2007)

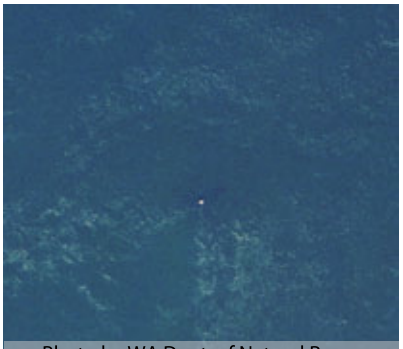


Photo by WA Dept. of Natural Resources (2004)

At high tide this wilderness island nearly submerges completely beneath water. It is located 600 yards east of Colville Island and is 0.006 acres. The island's habitat is reef. The navigational aid Davidson Rock Light "1" is located here. 2005 surveys found glaucous-winged gulls, double-crested cormorants, and harbor seals present on the rock. In the years 2000 to 2004 double-crested cormorants, pelagic cormorants, and harbor seals were found here.

08. Castle Island — 48° 25' 17" N, 122° 49' 20" W

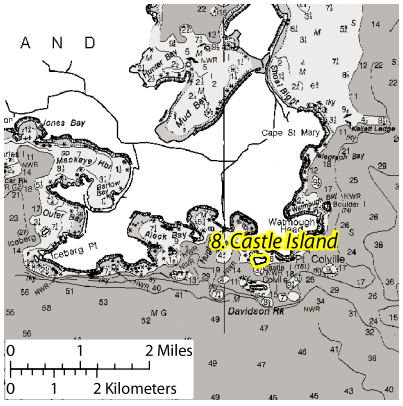


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

Castle Island is an 8.130 acre wilderness island situated north of Colville Island and near the shore of Lopez Island. It is roughly triangular in shape with its north and southeast sides almost vertical cliffs. The west side, though less steeply inclined, can be climbed only with difficulty. The habitat on this island includes rocky shoreline, cliffs, and herbaceous bald. Douglas fir, shore pine, elderberry, salal, and grasses growing in the shallow soil were recorded here. In 2009, wildlife present on the island included turkey vultures, bald eagles, and black oystercatchers. Wildlife with young in 2009 included pigeon guillemots. Between 2000 and 2004, harbor seals, pelagic cormorants, and pigeon guillemots were present.

09. 3 Unnamed Islands (Blind Island) 48° 25' 23" N, 122° 49' 37" W

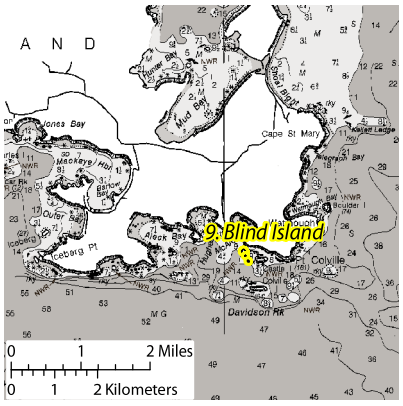


Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Ecology (2006)

This group consists of three wilderness islets located immediately west of Castle Island. Blind Island, the northernmost island, is the largest and circular in shape. The middle island is 20 to 30 yards to the southeast. The southern-most island is about 60 to 70 yards southeast of the middle one and is somewhat higher; it has rather precipitous sides and is fairly level on top. Together the acreage for this group is 2.126. The habitat structure of these islets consists of rocky shoreline and herbaceous bald. The middle rock is devoid of vegetation while the other two have low-growing vegetation. In 2009 pigeon guillemot, marbled murrelets, glaucous-winged gulls, and harbor seals were present on the islands. Black oystercatchers and harbor seals were present here from 2000 to 2004.

10. Aleck Rocks 48° 25' 22" N, 122° 50' 60" W

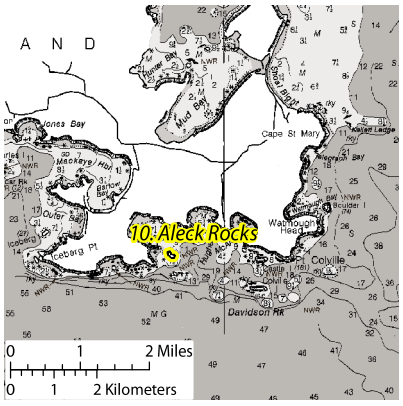


Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Ecology (2006)

This includes two groups of rocky wilderness islets situated in the south side of the entrance to Aleck Bay. The islets appear as a low-profile 3.673 acre island extending about 20 feet above water. It is dissected roughly north to south by a low, craggy depression which is underwater at high tides. Small pocket beaches exist at lower tides. Herbaceous bald, rocky shoreline, and sandy, gravelly shoreline comprise the habitats found here. In 2009 no wildlife were observed on this island, but between 2000 and 2004 both black oystercatchers and harbor seals were observed.

11. Swirl Island — 48° 25' 6" N, 122° 50' 54" W

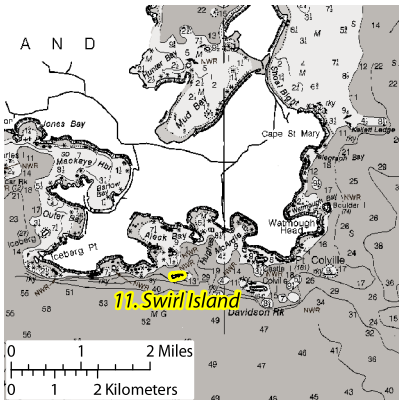



Photo by Khem So/USFWS (2007)


Photo by WA Dept. of Ecology (2006)

Swirl Island is the visible portion of a long wilderness reef which trends northwest to southeast. It is located about 450 yards south of Aleck Rocks. Its habitat structure is rocky shoreline with very sparse vegetation. The area exposed at high tide totals 2.303 acres. Wildlife present on the island in 2009 included Heermann's gulls, glaucous-winged gulls, black oystercatchers, bald eagles, and harbor seals. Black oystercatchers, harlequin ducks, and harbor seals were counted in surveys conducted between 2000 and 2004.

12. Unnamed Rock — 48° 25' 38" N, 122° 50' 24" W

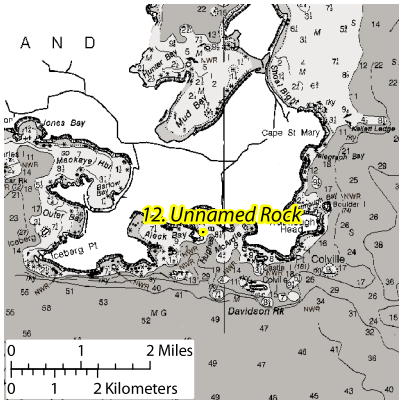



Photo by Khem So/USFWS (2007)


Photo by WA Dept. of Ecology (2006)

This is a single, unvegetated, 0.064 acre wilderness rock with a habitat described as rocky shoreline. It is located offshore a short distance in Hughes Bay at the southeast end of Lopez Island. Wildlife have not been observed here during survey efforts.

13. 4 Unnamed Islands — 48° 25' 11" N, 122° 52' 5" W

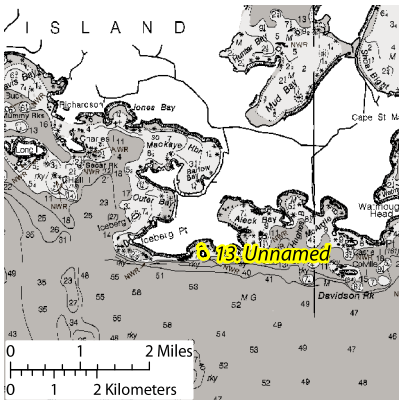


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a circular, low-profile wilderness island with two or three small bare rocks nearby. The total acreage is 3.407 acres. It is separated from Lopez Island by about 200 yards of deep water. The habitat structure of this island includes herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. There is a small Douglas fir stand on the north island. In 2009 harbor seals and glaucous-winged gulls were present. From 2000 to 2004 harbor seals and black oystercatchers were recorded.

14. 3 Unnamed Islands — 48° 25' 6" N, 122° 53' 10" W

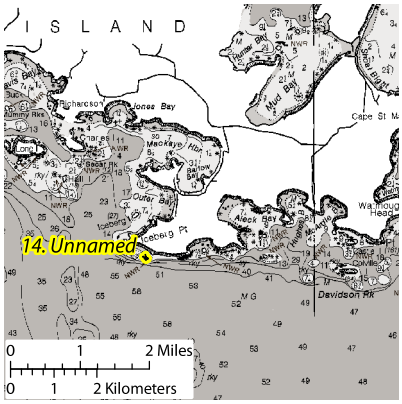


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

These are rocky wilderness islets that are obviously part of a submerged reef extending off the south end of a small point along the shoreline of Lopez Island. They are 0.591 acres in size. The habitat structure here is rocky shoreline. The 2009 survey found Heermann's gulls, glaucous-winged gulls, great blue herons, greater yellowlegs, and black oystercatchers present. Harbor seals were recorded here from 2000 to 2004.

15. Hall Island — 48° 26' 6" N, 122° 54' 43" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

Hall Island is a low-profile wilderness island rising about 25 feet above sea level. It is located about 605 yards south of Charles Island and is 4.701 acres. The island's habitat consists of rocky shoreline, sandy, gravelly shoreline, and herbaceous bald. In 2009 wildlife present on the island included rock sandpipers, Heermann's gulls, harlequin ducks, and black oystercatchers. Wildlife found with young in 2009 includes harbor seals and glaucous-winged gulls. Black oystercatchers, double-created cormorants, glaucous-winged gulls, harlequin ducks, and harbor seals were present for surveys from 2000 to 2004.

16. Unnamed Island — 48° 26' 8" N, 122° 54' 54" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Natural Resources (2004)

This low-profile wilderness island rises only a few feet above high tide. It is located about 205 yards west of Hall Island and is 0.467 acres. Its habitat is primarily rocky shoreline. In 2009 Heermann's gulls, harlequin ducks, glaucous-winged gulls, black turnstones, black oystercatchers, and harbor seals were present on the island. Between 2000 and 2004 black oystercatchers and harbor seals were recorded here.

17. Secar Rock — 48° 26' 16" N, 122° 54' 25" W

Photo by USFWS (2003)

Photo by WA Dept. of Ecology (2006)

Secar Rock is a low-profile wilderness island rising 15 feet above high tide. It is located midway between Charles and Hall Islands. The majority of this 1.302 acre island is comprised of rocky shoreline habitat. In 2009 no wildlife were observed on the island. However between 2000 and 2004 black oystercatchers, double-crested cormorants, glaucous-winged gulls, harlequin ducks, harbors seals, and pigeon guillemots were observed.

18. Unnamed Island (Round Rock) — 48° 26' 24" N, 122° 54' 10" W

Photo by USFWS (2003)

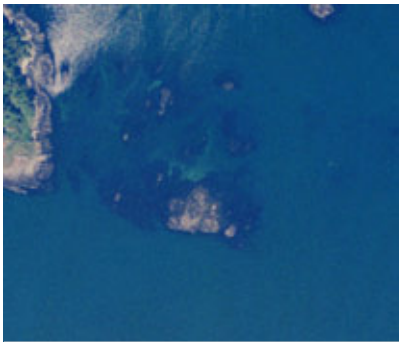


Photo by WA Dept. of Natural Resources (2004)

The exposed portion of this wilderness island rises 12 feet above sea level and is located about 375 yards east of Charles Island and immediately northeast of Secar Rock. The habitat structure of this 0.616 acre island is rocky shoreline. In 2009 harbor seals and black oystercatchers were present on the island. From 2000 to 2004 black oystercatchers, double-crested cormorants, harlequin ducks, harbor seals, pelagic cormorants, and rhinoceros auklets were observed.

19. 3 Unnamed Islats — 48° 26' 22" N, 122° 55' 9" W

Photo by WA Dept. of Ecology (2006)


Photo by WA Dept. of Ecology (2006)

This group consists of three rocky wilderness islets located just offshore and to the southeast of Long Island, to which they are connected by a submerged reef. The total acreage of this group is 2.082 acres. The primary habitat is rocky shoreline. Grasses occur on the largest islet while the other two islets have no vegetation. In 2009, black oystercatchers were present on these islets. Harbor seals were present between 2000 and 2004.

20. 13 Unnamed Islets — 48° 26' 17" N, 122° 55' 34" W

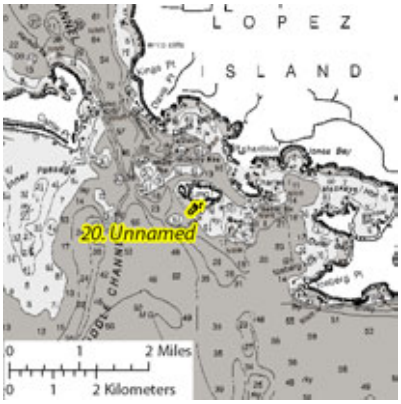



Photo by WA Dept. of Ecology (2006)


Photo by WA Dept. of Ecology (2006)

This is a large group of small low-profile wilderness islets and rocks. They are located off the south shore of Long Island just west of the group described in number 19. Collectively they are 5.085 acres. Rocky shoreline makes up the primary habitat for this group although some grasses grow on the larger islets. Bald eagles were present on this group in 2009. Also in 2009 harbor seals were present with pups. Wildlife recorded between 2000 and 2004 included black oystercatchers, double-crested cormorants, glaucous-winged gulls, harlequin ducks, harbor seals, and rhinoceros auklets.

21. Mummy Rocks — 48° 26' 57" N, 122° 55' 47" W

Photo by Khem So/USFWS (2007)

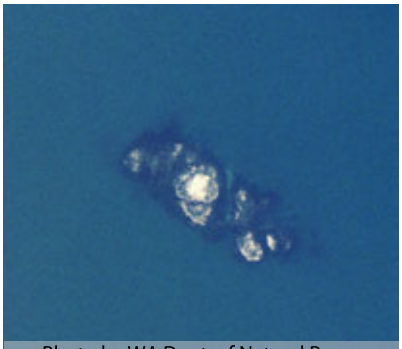


Photo by WA Dept. of Natural Resources (2004)

Mummy Rocks, located midway between Long Island and Point Davis on Lopez Island, consists of two low-profile wilderness islets with a habitat structure of rocky shoreline. They total 1.325 acres. In 2009 harlequin ducks, glaucous-winged gulls, and American crows were present on the islets. Also, harbor seals with pups were present in 2009. Between 2000 and 2004 black oystercatchers, double-crested cormorants, glaucous-winged gulls, harlequin ducks, and harbor seals were observed.

22. Islets and Rocks associated with Deadman Island — 48° 27' 33" N, 122° 56' 35" W

Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Natural Resources (2004)

This is a grouping of several wilderness islets and rocks northeast of Deadman Island. They are about 300 to 400 yards offshore from Lopez Island and separated from Deadman Island by 50 to 100 yards of deep water. They trend roughly north to south and together they total 1.822 acres. The habitat of this group is rocky shoreline. Harbor seals and glaucous-winged gulls were found here in 2009. From 2000 to 2004 black oystercatchers and harbor seals were found.

23. Shark Reef — 48° 28' 34" N, 122° 56' 52" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Natural Resources (2004)

This is a wilderness reef formation with two rocky tips exposed at high tide. It is situated 200 to 300 yards off of the west shore of Lopez Island, about 1.5 miles north of Point Davis, and is 0.160 acres. Harbor seal young were present in 2009. Harbor seals were also present between 2000 and 2004.

24. Harbor Rock — 48° 28' 11" N, 122° 58' 13" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a low-profile wilderness rock with a habitat structure of rocky shoreline. It is located about 200 yards offshore of San Juan Island at the south side of Griffin Bay and is 0.558 acres. Black oystercatchers were present in 2009 along with harbor seals and their young. In 2000 through 2004 black oystercatchers, harlequin ducks, and harbor seals were present.

25. Unnamed Rock (North Pacific Rock) 48° 28' 17" N, 122° 59' 48" W

Photo by USFWS (1978)

Photo by Khem So/USFWS (2007)

This is a low wilderness reef located off the east shore of San Juan Island in Griffin Bay that is submerged at maximum high tide. The habitat structure is classified as reef with an acreage of 0.022. In 2009 pelagic cormorants, glaucous-winged gulls, and double-crested cormorants were present on this reef. Harbor seals were observed from 2000 to 2004.

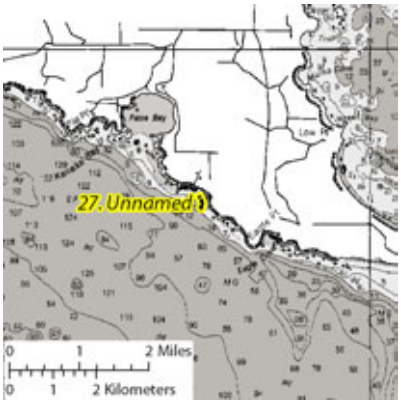
26. Halftide Rocks 48° 28' 43" N, 123° 0' 0" W

Photo by Khem So/USFWS (2007)

Photo by Khem So/USFWS (2007)

These wilderness rocks are awash at high tide, thus leading to a habitat classification of reef. They are located about three quarters of a mile north of North Pacific Rock in Griffin Bay and total 0.133 acres in size. In 2009 Heermann's gulls and glaucous-winged gulls were present on the island. Harbor seals with pups were also present in 2009. Double-crested cormorants and harbor seals were observed from 2000 to 2004.

27. 7 Unnamed islands — 48° 28' 4" N, 123° 3' 10" W



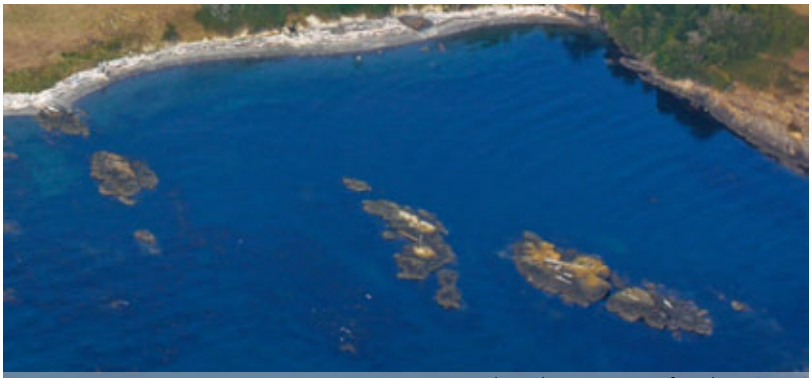


Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Natural Resources (2004)

These are a series of wilderness islets which extend out from San Juan Island. They are midway between False Bay and Eagle Point. Collectively they total 2.177 acres. The habitat structure is rocky shoreline. Surveys in 2009 found Heermann's gulls and glaucous-winged gulls present along with harbor seals and their pups. Black oystercatchers, glaucous-winged gulls, and harbor seals were present between 2000 and 2004.

28. Low Island — 48° 32' 36" N, 123° 9' 53" W

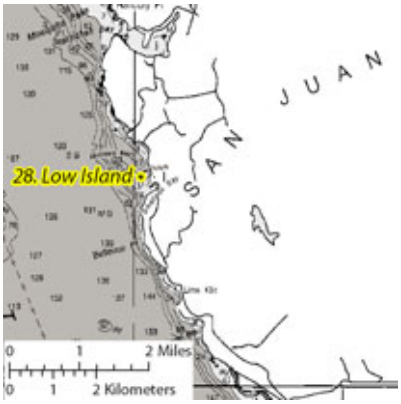


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

Low Island is a small, rocky bench designated as wilderness and with a habitat structure of rocky shoreline. It is located about 200 yards off San Juan State Park on San Juan Island and is 0.825 acres in size. Surveys in 2009 found black oystercatchers and great blue herons present on the island. In 2009 harbor seals with their young were also present on the island. Between 2000 and 2004 black oystercatchers, harbor seals, and pelagic cormorants were found.

29. Pole Island — 48° 36' 3" N, 123° 10' 5" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Natural Resources (2004)

Pole Island is a circular shaped, low-profile, wilderness island 0.721 acres in size. It is situated between San Juan and Henry Islands. Its habitat consists of sandy, gravelly shoreline, rocky shoreline, and herbaceous bald. Plant species noted on this island include wild rose, ocean spray, yarrow, gumweed, plantain, Oregon grape, and grasses. No wildlife have been observed on Pole Island during recent surveys.

30. Barren Island — 48° 37' 22" N, 123° 9' 39" W

Photo by USFWS (2003)

Photo by WA Dept. of Ecology (2006)

This is a low-profile, dome-shaped wilderness island located about one-half mile off San Juan Island. The habitat of this sparsely vegetated island is comprised of herbaceous bald and rocky shoreline. It is 0.721 acres in size. Wildlife present on this island in 2009 included pelagic cormorants, double-crested cormorants, and harbor seals. In surveys taken between 2000 and 2004 black oystercatchers, double-crested cormorants, harbor seals, pelagic cormorants, and pigeon guillemots were present.

31. Battleship Island — 48° 37' 29" N, 123° 11' 7" W

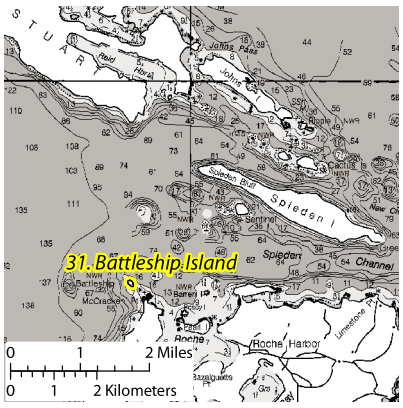



Photo by USFWS (2003)


Photo by WA Dept. of Ecology (2006)

This is a circular-shaped wilderness island 2.887 acres in size with maximum elevation of 40 feet. It is located northwest of McCracken Point on the north end of Henry Island. Its habitat structure is classified as rocky shoreline with cliffs, woodland, and herbaceous bald. Trees growing on the island include Douglas fir, madrone, and willow. Understory components include ocean spray and grasses. Wildlife found on this island in 2009 included pigeon guillemot and harbor seal. Harbor seals were recorded between 2000 and 2004.

32. Sentinel Rock — 48° 38' 24" N, 123° 9' 26" W

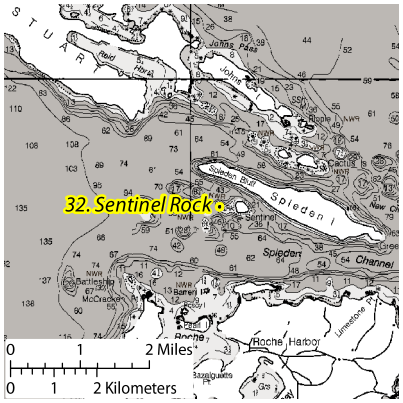
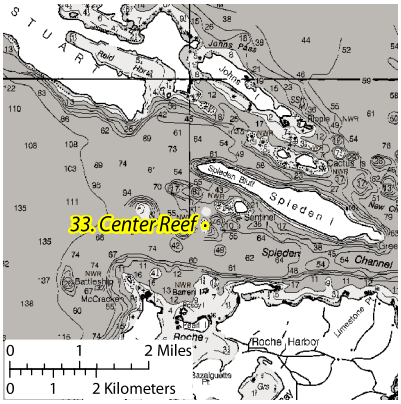



Photo by USFWS (2003)


Photo by WA Dept. of Natural Resources (2004)

Sentinel Rock is a low-profile wilderness island with an elevation of five feet. It is about 350 yards west of Sentinel Island and is 0.329 acres in size. The habitat of this island is rocky shoreline. Lichens and mosses primarily cover the rock's surface. Wildlife present in 2009 include pelagic cormorants, also harbor seals were present with their young. From 2000 to 2004 black oystercatchers, glaucous-winged gulls, harlequin ducks, harbor seals, and pelagic cormorants were found.

33. Center Reef — 48° 38' 11" N, 123° 9' 42" W



Spieden Channel Buoy 3 to the left of Center Reef — Photo by Khem So/USFWS (2007)

This is an extensive submerged wilderness reef, visible just beneath the surface. It is located in Spieden Channel, about 600 yards to the southwest of Sentinel Rock. It is 0.054 acres in size. It is classified as a reef habitat. Wildlife have not been observed here during survey efforts.

34. Gull Reef — 48° 39' 17" N, 123° 8' 49" W

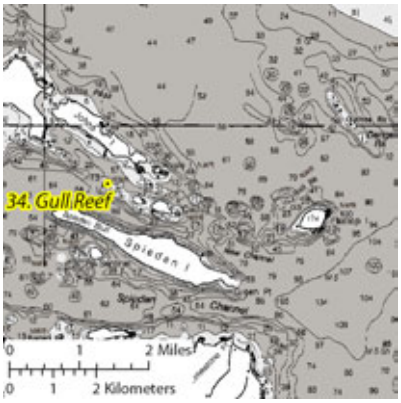


Photo by Khem So/USFWS (2007)

Photo by USFWS (2003)

This wilderness reef rises about two feet above high tide and is classified as a reef habitat. It is located about 1,000 yards west of Shag Reef and is 0.251 acres. The 2009 survey found pigeon guillemots and double-crested cormorants present on this reef along with harbor seals and their young. Black oystercatchers, double-crested cormorants, harlequin ducks, harbor seals, and pelagic cormorants were observed between 2004 and 2009.

35. Ripple Island — 48° 39' 25" N, 123° 7' 51" W

Photo by USFWS (2003)

Photo by WA Dept. of Ecology (2006)

Ripple Island is a low, flat wilderness island with a maximum elevation of about 20 feet and a size of 4.151 acres. It is separated from Johns Island by a narrow, relatively shallow channel about 100 yards wide. Its habitat is made up of rocky shoreline and sandy, gravelly shoreline along with herbaceous bald and woodland. The low vegetation includes sea birch, wild rose, gumweed, and grasses. Wildlife present on the island in 2009 included surfbirds, black oystercatchers, bald eagles, and American crows. In 2009 harbor seals were present with young. From 2000 to 2004 black oystercatchers, harlequin ducks, and harbor seals were present.

36. Unnamed Reef (Shag Reef) — 48° 39' 15" N, 123° 8' 2" W

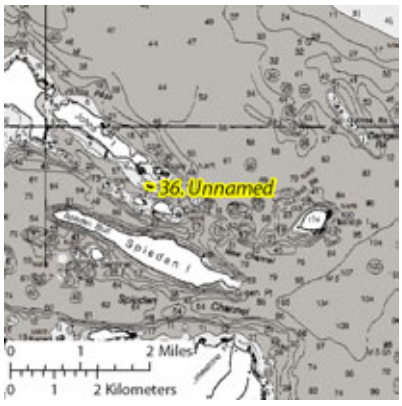


Photo by USFWS (2003)

Photo by WA Dept. of Natural Resources (2004)

Shag Reef is essentially a flat wilderness reef with the highest point rising to about a foot above high tide. The exposed portion of the reef is divided into two parts by a deep depression that extends across the central portion. It is situated between Ripple Island and the Cactus Islands and is 0.766 acres. Wildlife present on this island in 2009 were pigeon guillemots, pelagic cormorants, glaucous-winged gulls, and black oystercatchers. Harbor seals with young were also present in 2009. Between 2000 and 2004 black oystercatchers, harlequin ducks, and harbor seals were present.

37. Unnamed Island (Little Cactus Island) — 48° 38' 52" N, 123° 7' 30" W

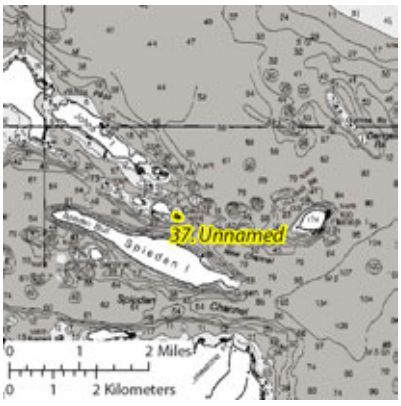


Photo by USFWS (2003)

Photo by WA Dept. of Ecology (2006)

Little Cactus Island is the smallest of the Cactus Island group at 2.103 acres. It is located 50 yards to the east of the two largest islands. It is a low-profile wilderness island. Its habitat consists of rocky shoreline and herbaceous bald. In 2009 harbor seals with pups were found on this island. From 2000 to 2004 black oystercatchers, harlequin ducks, and harbor seals were found.

38. Gull Rock — 48° 39' 4" N, 123° 5' 23" W

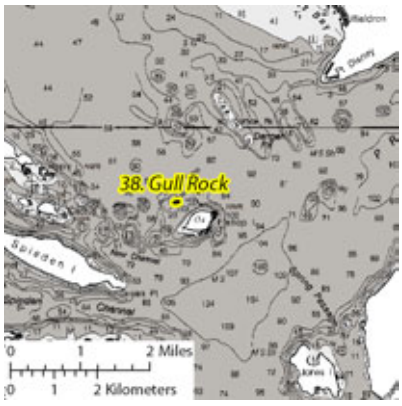


Photo by USFWS (2003)

Photo by WA Dept. of Ecology (2006)

Gull Rock has a flat profile with a maximum elevation of about 30 feet and a size of 1.804 acres. It is located 500 yards northwest of Flattop Island. This wilderness island is divided almost in two by differential erosion along a stratum of soft materials that is bound in each side by hard layers of conglomerate. The habitat structure is herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. Wildlife present on the island in 2009 included pigeon guillemots and glaucous-winged gulls. Harbor seals were present with pups in 2009. Between 2000 and 2004 black oystercatchers, double-crested cormorants, glaucous-winged gulls, harbor seals, pelagic cormorants, and pigeon guillemots were observed.

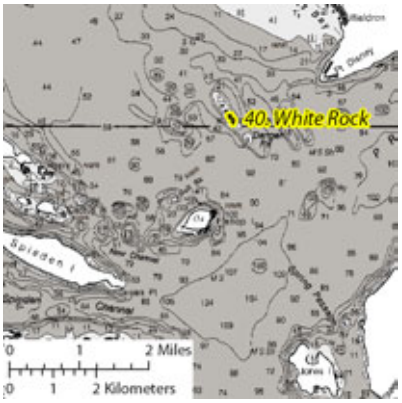
39. Flattop Island — 48° 38' 49" N, 123° 4' 57" W

Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Ecology (2006)

Flattop Island is located about one mile northeast of Green Point on Spieden Island. This 57.612 acre wilderness island appears slightly elliptical in shape, with a rocky, irregular surface. The highest point on the island is 174 feet above sea level. The entire surface of the island slopes toward the southeast at a 25º angle . The variety of habitats here includes woodland, herbaceous bald, cliffs, rocky shoreline, and sandy, gravelly shoreline. Tree species include Douglas fir, madrone, shore pine, Garry oak, and willow. Wildlife present in 2009 included river otters, pigeon guillemots, and black oystercatchers. In 2009 both bald eagles and harbor seals were present with young. Between 2000 and 2004 bald eagles, black oystercatchers, harbor seals, and pigeon guillemots were present.

40. White Rocks — 48° 40' 6" N, 123° 4' 19" W



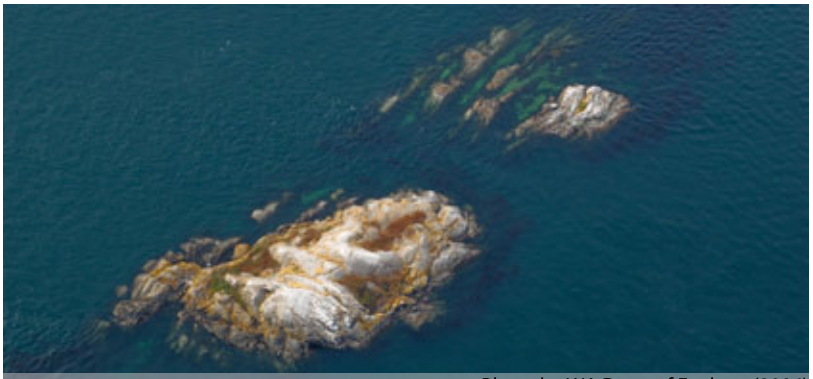


Photo by WA Dept. of Ecology (2006)

Photo by Khem So/USFWS (2007)

White Rocks is a wilderness area consisting of one large island and one very small islet. They are located approximately midway between Flattop Island and Point Disney on Waldron Island. Maximum elevation is 35 feet and size is 2.118 acres. The habitat is rocky shoreline and herbaceous bald. Wildlife present on the island in 2009 were pigeon guillemot and glaucous-winged gulls. Wildlife with young present in 2009 were bald eagles and harbor seals. From 2000 to 2004 black oystercatchers, double-crested cormorants, harbor seals, pelagic cormorants, and pigeon guillemots were found.

41. Mouatt Reef — 48° 41' 5" N, 123° 2' 47" W

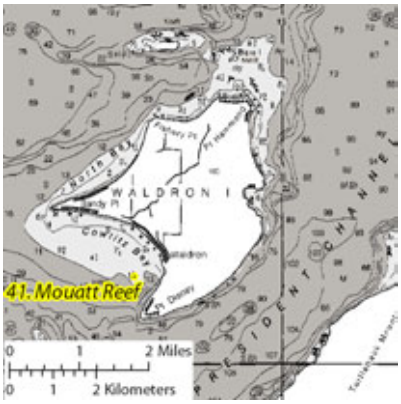


Photo by USFWS (1978)

This is an extensive wilderness reef, trending northwest to southeast, which is awash at high tide. The 0.023 acre reef is located in Cowlitz Bay, on the west side of Waldron Island. Wildlife have not been observed here during survey efforts.

42. Skipjack Island — 48° 43' 56" N, 123° 2' 9" W

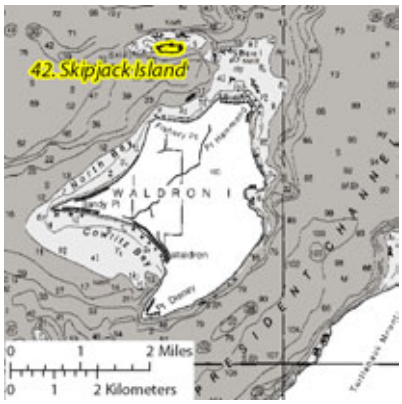


Photo by WA Dept. of Ecology (2006)

Photo by USFWS (2003)

Skipjack Island, with an area of 19.866 acres, is located north of Waldron Island. The north side of this wilderness island is very precipitous, with sheer cliffs extending nearly the full length of the north shoreline. The maximum elevation is about 120 feet. Skipjack Island Light, a navigational aid, is located in the northwest corner of the island. Habitats here include forest, herbaceous bald, cliffs, rocky shoreline, and sandy, gravelly shoreline. Tree species include Douglas fir, madrone, willow, Rocky Mountain juniper, and willow. Surveys found turkey vultures, pigeon guillemots, black oystercatchers, bald eagles, and American crows present on the island in 2009. Also, harbor seals with pups were present in 2009. Bald eagles, black oystercatchers, harbor seals, pigeon guillemots, and rhinoceros auklets were observed between 2000 and 2004.

43. Unnamed Island — 48° 43' 59" N, 123° 1' 47" W

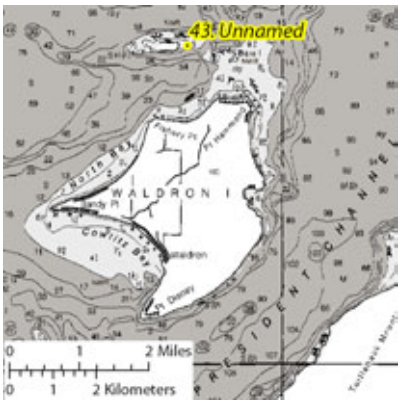


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a small wilderness islet connected to the east end of Skipjack Island by a submerged reef. It is 0.077 acres. The habitat consists of rocky shoreline. Harbor seals with pups were present on the island in 2009. Harbor seals were present between 2000 and 2004.

44. Clements Reef — 48° 46' 34" N, 122° 53' 20" W

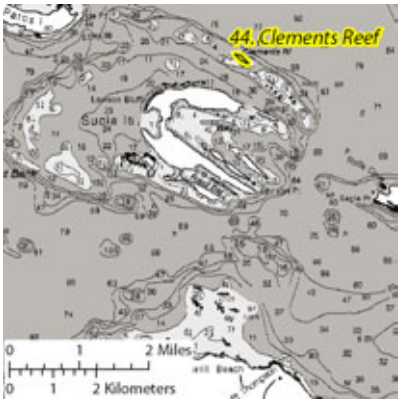


Photo by USFWS (2003)

Clements Reef is comprised of three small elongated reefs, which are located north of Sucia Island. This wilderness reef is completely submerged. It is listed as having a habitat structure of reef and a size of 4.747 acres, when exposed. The Clements Reef Buoy 2, a navigational aid, is located to the northwest of the reef. Wildlife noted as present in the area in 2009 included pigeon guillemots, Heermann's gulls, glaucous-winged gulls, and black oystercatchers. Harbor seals with pups were also present in 2009. Between 2000 and 2004 harbor seals were present.

45. Unnamed Island — 48° 46' 11" N, 122° 52' 46" W

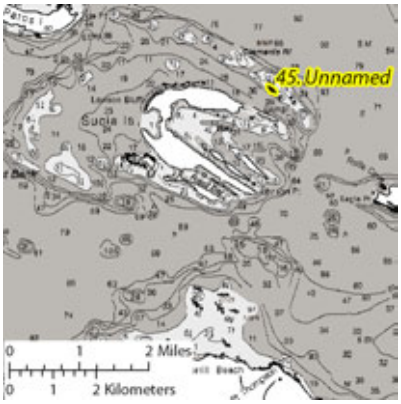


Photo by Khem So/USFWS (2007)

The habitat structure for this wilderness island is reef and its size is 0.971 acres. It is almost always submerged or nearly submerged. The Clements Reef Danger Buoy, a navigational aid, is located to the southeast of the reef. Wildlife present here in 2009 included pigeon guillemots, Heermann's gulls, glaucous-winged gulls, and black oystercatchers. In 2009 harbor seals with pups were present. Wildlife present between 2000 and 2004 included black oystercatchers, elephant seals, harbor seals, pelagic cormorants, and pigeon guillemots.

46. Parker Reef — 48° 43' 33" N, 122° 53' 39" W

Photo by WA Dept. of Ecology (2006)

Photo by Khem So/USFWS (2007)

This is a broad, flat, largely submerged, rocky, wilderness shelf which extends northward from the north shore of Orcas Island. About five acres are exposed at extreme low tide at a distance of about one mile from shore. Except for a small, narrow, rocky ridge, it is completely covered at high tide. The habitat is classified as reef. The navigational aid on this island is the Parker Reef Light. In 2009 wildlife species found on the reef included scoter species, glaucous-winged gulls, and great blue herons. Harbor seals with pups were present in 2009 also. Wildlife found here from 2000 to 2004 included Brandt's cormorants, double-crested cormorants, harlequin ducks, harbor seals, and pelagic cormorants.

47. The Sisters (Lone Tree Island) 48° 41' 37" N, 122° 45' 28" W

Photo by WA Dept. of Ecology (2006)

The Sisters Islands consist of four wilderness islands or islet groups situated to the south and southeast of Clark Island. The northern three are identified collectively as The Sisters. The acreage is listed as 4.994. The southern-most island is identified separately as Little Sister and is discussed under Number 48 below. The Sisters (47) consist of two major islands, with a group of small islets and rocks in between. The largest and most northern of the group is referred to as Lone Tree Island, as it had a single conifer on it at one time. This island is about 20 feet in elevation. The second largest, or most southern of this group, has an elevation of about 15 feet. The islands have a rather low profile. The Sisters Light "17" navigational aid is located here. The habitat is rocky shoreline, herbaceous bald, and sandy, gravelly shoreline. Wildlife present on this island in 2009 were glaucous-winged gulls, turkey vultures, pigeon guillemots, and black turnstones. Wildlife with young on the island in 2009 included harbor seals and black oystercatchers. From 2000 to 2004 black oystercatchers, harbor seals, pelagic cormorants, and pigeon guillemots were located here.

48. The Sisters (Little Sister Island) 48° 41' 23" N, 122° 45' 35" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is the southern-most island in the Sisters Island group. It is 0.929 acres. The habitat on this wilderness island is identified as rocky shoreline, cliffs, and herbaceous bald. Wildlife found here in 2009 included pigeon guillemots and glaucous-winged gulls. Harbor seals were present in 2009 with pups. Black oystercatchers, harbor seals, pelagic cormorants, and pigeon guillemots were found here between 2000 and 2004.

49. Unnamed Island — 48° 35' 43" N, 122° 58' 36" W

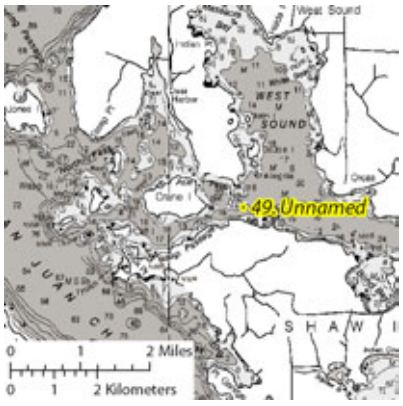


Photo by Khem So/USFWS (2007)

Photo by USFWS (1978)

This is a 0.049 acre rocky islet located immediately east of Bell Island. The Wasp Passage Light "5" navigational aid is located here. The habitat on this wilderness island is identified as reef. During the 2009 survey, surfbirds were found present. Surveys from 2000 to 2004 did not find wildlife here.

50. Tift Rocks — 48° 34' 40" N, 122° 59' 54" W

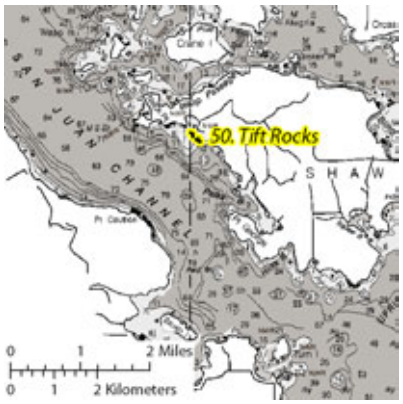


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Natural Resources (2004)

Tift Rocks is a group of five wilderness rock clusters extending only a few feet above water about 150 to 200 yards off the south shore of Shaw Island. This group is 2.465 acres. The habitat found here is herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. Tree species growing on the largest island include Douglas fir, shore pine, and Rocky Mountain juniper. Herbaceous vegetation includes wild rose, gumweed, yarrow, and grasses. Mink, harbor seals, and glaucous-winged gulls were present on the islands in 2009. Between 2000 and 2004 double-crested cormorants and harbor seals were identified here.

51. Unnamed Rock (Reef Point) 48° 31' 41" N, 122° 58' 5" W

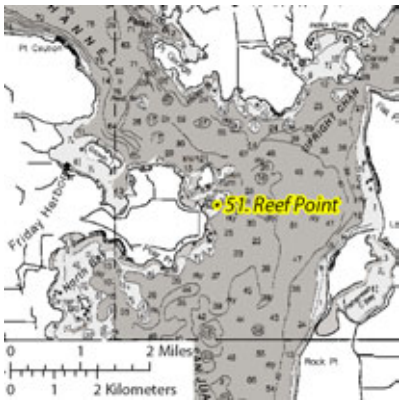


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a barren, rocky wilderness islet which is part of a submerged extension of San Juan Island near Reef Point. It is separated from nearby shoreline by 50 to 80 yards of deep water and is 0.608 acres in size. The habitat of this rock is rocky shoreline. In 2009 Bonaparte's gulls, black oystercatchers, American crows, and Heermann's gulls were present. Also harbor seals were present with pups. From 2000 to 2004 black oystercatchers, double-crested cormorants, harlequin ducks, harbor seals, and pelagic cormorants were present.

52. Turn Rocks 48° 32' 6" N, 122° 57' 52" W

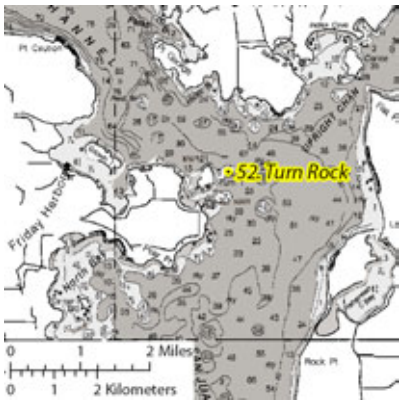


Photo by Khem So/USFWS (2007)

This wilderness rock is located immediately east of Turn Island and is awash at high tide. It is listed at 0.197 acres. Turn Rock Light "3" is the navigational aid on this rock. The habitat is identified as reef. Heermann's gulls, harbor seals, harlequin ducks, and glaucous-winged gull chicks were present in 2009. Double-crested cormorants and harbor seals were present between 2000 and 2004.

53. Shag Rock — 48° 35' 30" N, 122° 52' 31" W

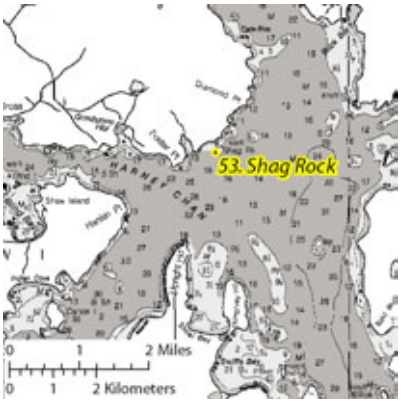



Photo by Khem So/USFWS (2007)

Shag Rock is located about 275 yards off the south shore of Orcas Island, rising about two feet above high tide level. The navigational aid on this wilderness island is the Shag Rock Daybeacon. Size is 0.049 acres. Rocky shoreline and sandy, gravelly shoreline make up the habitat of this rock. No wildlife was found on the island in the 2005 survey. From 2000 to 2004 harbor seals were recorded here.

54. Flower Island — 48° 32' 43" N, 122° 51' 15" W


Photo by Khem So/USFWS (2007)


Photo by WA Dept. of Ecology (2006)

Flower Island is located near the northeast corner of Lopez Island. It slopes up to a near vertical cliff on the eastern side, which reaches a maximum elevation of 74 feet. It is 3.541 acres in size. The habitats on this wilderness island are herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. Tree species observed include Douglas fir, madrone, alder, and willow. Shrubs include wild rose, snowberry, oceanspray and Himalayan blackberry. No wildlife was observed on this island during the 2009 survey. From 2000 to 2004 black oystercatchers, harbor seals, and pigeon guillemots were observed.

55. Willow Island — 48° 32' 26" N, 122° 49' 21" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a dome-shaped, elongated wilderness island located near the southwest side of Blakely Island with a precipitous, rocky shoreline on all sides. It is 10.214 acres. Habitats on this island are rocky shoreline, cliffs, woodland, and herbaceous bald. Tree species found here include Douglas fir, willow, and madrone. Harbor seals with pups were observed on this island in 2009. Between 2000 and 2004 harbor seals and pigeon guillemots were found here.

56. Lawson Rock — 48° 31' 51" N, 122° 47' 20" W

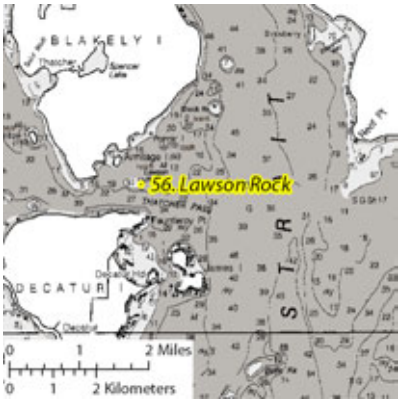


Photo by Khem So/USFWS (2007)

Lawson Rock, located at the east entrance of Thatcher Pass between Blakeley and Decatur Islands, is exposed only at low tide and is 0.005 acres in size. This wilderness rock is marked by Lawson Rock Light 2 navigational aid. The habitat is reef. Recent wildlife surveys have not found wildlife present here.

57. Pointer Island — 48° 32' 18" N, 122° 46' 56" W


Photo by Khem So/USFWS (2007)


Photo by WA Dept. of Ecology (2006)

This is a low, flat-topped wilderness islet situated about 600 yards from the southeast corner of Blakely Island. It extends about 16 feet above high tide and is 0.591 acres. It consists of a rocky shoreline habitat. In 2009 swallow species, pigeon guillemots, and black oystercatchers were found on the island. Glaucous-winged gulls and harbor seals both with young were also present in 2009. Black oystercatchers, double-crested cormorants, glaucous-winged gulls, harbor seals, pelagic cormorants, and pigeon guillemots were present between 2000 and 2004.

58. Black Rock — 48° 32' 45" N, 122° 45' 57" W


Photo by Khem So/USFWS (2007)


Photo by Khem So/USFWS (2007)

This is a low-profile wilderness island, rising about 20 feet above high tide, located about one-half mile east of Blakely Island, and 0.061 acres in size. Black Rock Light "9" navigational aid is located here. Its habitat is identified as rocky shoreline. In 2009 harbor seals were present. Between 2000 and 2004 double-crested cormorants and harbor seals were present.

59. 3 Unnamed Rocks (Spindle Rock) 48° 35' 13" N, 122° 48' 7" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Natural Resources (2004)

This is a group of three rocky wilderness islets off the northwest shore of Blakely Island. The farthest islet out is about 400 yards from shore and is known as Spindle Rock. It rises about 20 feet above high tide. The other two rocks are 30 to 40 yards from shore and rise only a few feet above high tide. Collectively they are 0.653 acres. The navigational aid found on the northernmost islet is Peavine Pass Rocks Daybeacon. The habitat of these islets is rocky shoreline. In 2009 raccoons, surfbirds, glaucous-winged gulls, black oystercatchers, and American crows were present on the islets. Harbors seals with pups were present in 2009 also. Harbor seals and pigeon guillemots were found here from 2000 to 2004.

60. Brown Rock 48° 36' 16" N, 122° 48' 41" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Natural Resources (2004)

This is a single wilderness rock about 200 yards off the south shore of Orcas Island. It is surrounded by deep water and is 0.199 acres. Habitat found here is rocky shoreline. In 2009 black oystercatchers were present on this rock. Black oystercatchers were also present from 2000 to 2004.

61. Unnamed Rock — 48° 36' 8" N, 122° 49' 56" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a bare wilderness islet, surrounded by deep water, located 200 to 300 yards off the south shore of Orcas Island. It is 0.076 acres in size. The habitat of this rock is rocky shoreline. Glaucous-winged gulls were found on this island in 2009. Other recent surveys did not find wildlife here.

62. South Peapod Rock — 48° 38' 2" N, 122° 45' 32" W

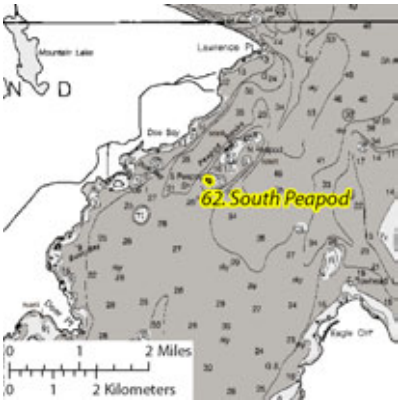


Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Ecology (2006)

South Peapod Rock is located about a mile to the southwest of North Peapod Rock in Rosario Strait. This is a low profile wilderness island 2.014 acres in size. Habitats found on here include cliffs, herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. In 2009 pigeon guillemots, pelagic cormorants, Heermann's gulls, harlequin ducks, and black oystercatchers were present on the island. Harbor seals and glaucous-winged gulls were present with young in 2009. Between 2000 and 2004 black oystercatchers, glaucous-winged gulls, harlequin ducks, harbor seals, pelagic cormorants, and pigeon guillemots were identified here.

63. Peapod Rocks — 48° 38' 24" N, 122° 45' 7" W

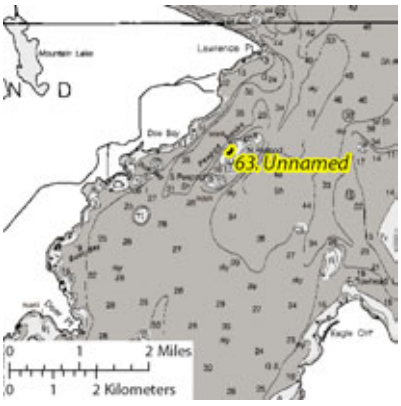


Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Natural Resources (2004)

Peapod Rocks are a grouping of three wilderness islets situated between North and South Peapod Rocks in Rosario Strait. They are 1.130 acres in size. The habitat of these rocks is rocky shoreline. Black turnstones, black oystercatchers, belted kingfishers, and bald eagles were present on these rocks in 2009. Also harbor seals with pups were present in 2009. From 2000 to 2004 black oystercatchers, harlequin ducks, and harbor seals were observed.

64. North Peapod Rock — 48° 38' 32" N, 122° 44' 42" W

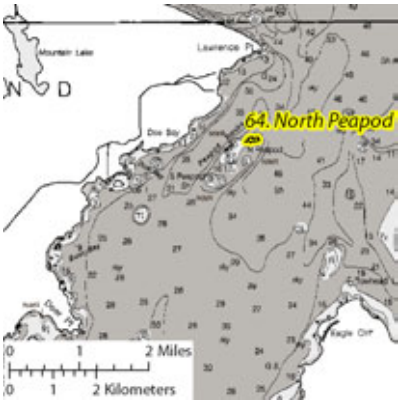


Photo by WA Dept. of Ecology (2006)

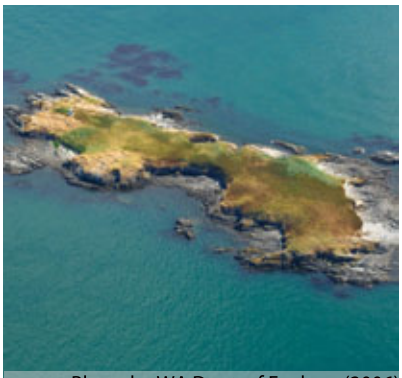


Photo by WA Dept. of Ecology (2006)

North Peapod Rock is located in Rosario Strait about a mile from the southeast shore of Orcas Island. This is a low-profile wilderness island with a maximum elevation of 28 feet and a size of 5.2 acres. The Peapod Rocks Light "15" navigational aid is found on the eastern end of this island. The habitats found here include herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. In 2009 pigeon guillemots, glaucous-winged gulls, and bald eagles were present. Harbor seals with pups were also present in 2009. Between 2000 and 2004 black oystercatchers, harbor seals, harlequin ducks, and pigeon guillemots were located here.

65. Eliza Rock — 48° 38' 37" N, 122° 34' 42" W


Photo by Khem So/USFWS (2007)


Photo by Khem So/USFWS (2007)

Eliza Rock is a circular, flat wilderness rock located about 100 to 150 yards off the south end of Eliza Island. It is 0.343 acres. The navigational aid on this rock is the Eliza Rocks Junction Light. The habitat here is rocky shoreline. Wildlife found during the 2009 survey included pigeon guillemots. Both harbor seals and black oystercatchers were present with young in 2009. Black oystercatchers, harbor seals, pelagic cormorants, pigeon guillemots, and Steller sea lions were present.

66. Viti Rocks — 48° 37' 60" N, 122° 37' 22" W

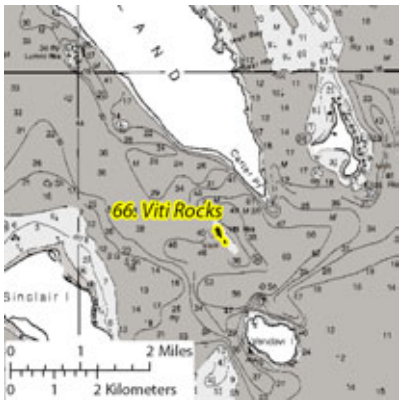



Photo by Khem So/USFWS (2007)


Photo by Khem So/USFWS (2007)

This group, located about .75 miles southwest of Carter Point on Lummi Island, consists of one large wilderness island and a small wilderness islet to the southeast. It is 2.72 acres. The larger island rises to an elevation of 35 feet. The smaller islet is the exposed portion of a reef which extends only a few feet above water at high tide. The Viti Rocks Light is located here. The habitats are identified as rocky shoreline, cliffs, and herbaceous bald. Pigeon guillemots were present in 2009. Birds with nests in 2009 included pelagic cormorants, glaucous-winged gulls, and double-crested cormorants. Also, harbor seals were present with pups in 2009. Between 2000 and 2004 black oystercatchers, double-crested cormorants, glaucous-winged gulls, harlequin ducks, harbor seals, pelagic cormorants, and pigeon guillemots were identified here.

68. Unnamed Rock (Bird Rocks) 48° 35' 52" N, 123° 0' 55" W

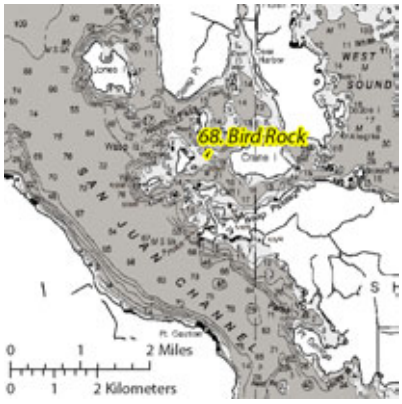



Photo by Khem So/USFWS (2007)


Photo by USFWS (2003)

This 0.111 acre wilderness rock located midway between Crane and McConnell Islands is awash at high tide. This is the location of Bird Rocks Light, a navigational aid. The habitat is classified as rocky shoreline. Harbor seals with pups were present in 2009. From 2000 to 2004 harbor seals were also present.

69. Unnamed Island 48° 35' 25" N, 123° 2' 3" W

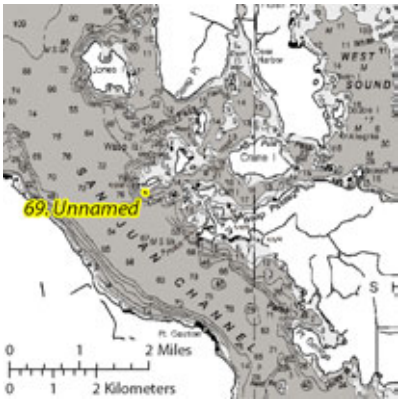



Photo by USFWS (1978)


Photo by WA Dept. of Natural Resources (2004)

This consists of a group of bare wilderness rocks which are exposed portions of a submerged reef that extends out from Yellow Island, they are awash at high tide. They are 0.203 acres. The habitat is identified as rocky shoreline. The 2009 survey found glaucous-winged gulls and harbor seals with pups present here. Surveys between 2000 and 2004 found double-crested cormorants and harbor seals present here.

70. Low Island — 48° 35' 21" N, 123° 1' 33" W

Photo by USFWS (2003)

Photo by WA Dept. of Ecology (2006)

Low Island is a low-profile wilderness island located about one-third mile south of McConnell Island and 1.391 acres in size. Habitats found here include herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. Black oystercatchers, bald eagles, and American crows along with harbor seals with pups were present here in 2009. Black oystercatchers, harbor seals, and pigeon guillemots were recorded between 2000 and 2009.

71. Nob Island — 48° 35' 27" N, 123° 1' 6" W

Photo by WA Dept. of Ecology (2006)

Photo by Khem So/USFWS (2007)

Located near the west side of Cliff Island in the Wasp Passage, Nob Island is a round, cone-shaped wilderness island rising to an elevation of 20 feet with a group of small rocks and islets located immediately to the southwest. The combined acreage is 1.393 acres. The habitat consists of herbaceous bald, rocky shoreline, and sandy gravelly shoreline. Tree species include Rocky Mountain juniper, Douglas fir, madrone, and immature Garry oaks. In 2009 harbor seals with pups were present. Between 2000 and 2004 black oystercatchers and harbor seals were found.

72. Unnamed Island — 48° 35' 12" N, 123° 0' 28" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

This is a small, circular wilderness island located off Shaw Island, from which it is separated by deep water. It is 0.210 acres. The habitat structure is rocky shoreline and herbaceous bald. Vegetation observed here includes Rocky Mountain juniper and grasses. Wildlife present on this island in 2009 included harbor seals with pups. Other recent surveys did not record wildlife.

73. Unnamed Island — 48° 34' 60" N, 123° 0' 49" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Natural Resources (2004)

This is a small wilderness islet located 150 yards off Shaw Island and 0.303 acres in size. Its habitat consists of herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. Tree species noted here include Garry oak and Rocky Mountain juniper. No recent surveys have recorded the presence of wildlife.

74. Unnamed Rocks — 48° 30' 17" N, 123° 0' 30" W

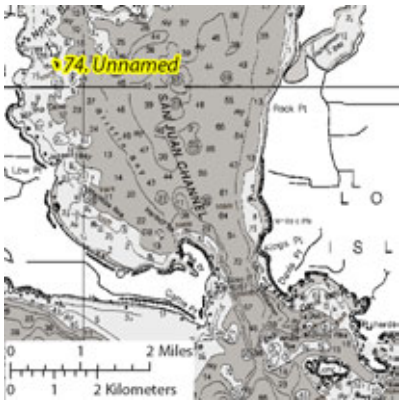


Photo by USFWS (2003)

Photo by WA Dept. of Natural Resources (2004)

This is a group of wilderness islets located in Griffin Bay off of the east shore of San Juan Island. The rocks are just south of Dinner Island and total 0.615 acres in size. Its habitat is rocky shoreline. In 2009 pigeon guillemots and harbor seals with pups were present. Between 2000 and 2004 black oystercatchers, double-crested cormorants, harlequin ducks, and harbor seals were observed here.

75. Smith Island — 48° 19' 9" N, 122° 50' 32" W

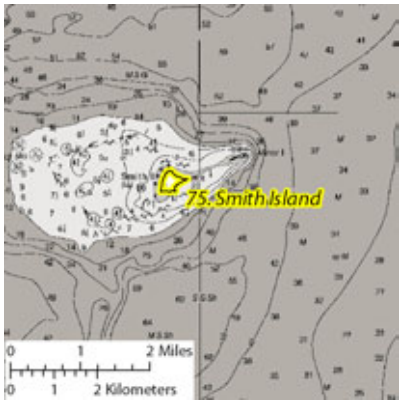
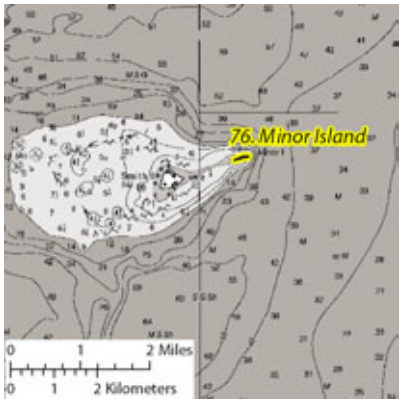


Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Ecology (2006)

Smith Island is a 37.883 acre non-wilderness island located midway between the Admiralty Inlet and Lopez Island. Its habitat consists of bluffs, wetlands, grasslands, herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. The Smith Island Light is located here. In the 2009 survey, a wide variety of wildlife was found on Smith Island including white-winged scoters, tufted puffins, swallows, surf scoters, rhinoceros auklets, pigeon guillemots, unidentified small shore birds, pelagic cormorants, marbled godwits, Heermann's gulls, harlequin ducks, double-crested cormorants, black turnstones, black oystercatchers, and American crows. Wildlife with young present in 2009 included harbor seals, glaucous-winged gulls, and bald eagles. Bald eagles have been identified here from 2000 to the most recent survey in 2009.

76. Minor Island — 48° 19' 26" N, 122° 49' 11" W



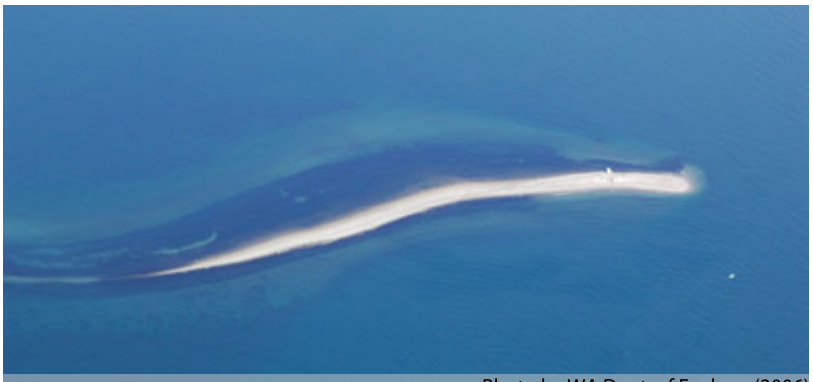


Photo by WA Dept. of Ecology (2006)

Photo by USFWS (2008)

Minor Island is a 2.483 acre non-wilderness island located in the eastern Strait of Juan de Fuca, midway between Admiralty Inlet and Lopez Island. The island is connected to Smith Island, which lies to the southwest, by a low sandy/gravelly spit. The Minor Island Light navigational aid is located here. Its habitat is classified as coastal spit, rocky shoreline, and sandy, gravelly shoreline. In 2009 wildlife found here included scoters, rhinoceros auklets, pigeon guillemots, Heermann's gulls, double-crested cormorants, black oystercatchers, and black-bellied plovers. An immature bald eagle was also present in 2009 along with glaucous-winged gulls with chicks and harbor seals with pups. Between 2000 and 2004 bald eagles were noted here.

77. Matia Island — 48° 44' 47" N, 122° 50' 13" W

Photo by WA Dept. of Ecology (2006)

Photo by WA Dept. of Ecology (2006)

Matia Island is a 158.965 acre wilderness island located in the Gulf of Georgia, north of Orcas Island, and east of Sucia Island. Its habitat includes old-growth dry-mesic Douglas-fir-Western Hemlock forest, dry Douglas-fir-(Madrone) forest and woodland, cliffs, freshwater emergent wetland, herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. In 2009 cormorants, swallows, pigeon guillemots, glaucous-winged gulls, Canada geese, black oystercatchers, and bald eagles were present. Also present in 2009 were harbor seals with pups. Between 2000 and 2004 bald eagles, black oystercatchers, harlequin ducks, harbor seals, pelagic cormorants, and pigeon guillemots were observed.

78. Puffin Island — 48° 44' 41" N, 122° 49' 16" W

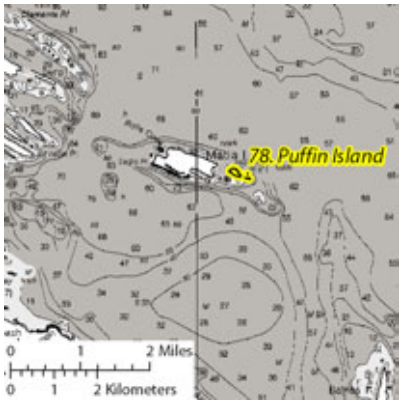



Photo by Khem So/USFWS (2007)

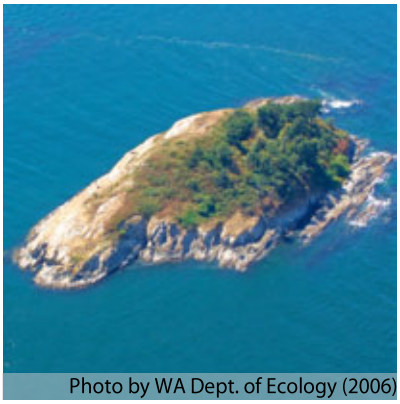


Photo by WA Dept. of Ecology (2006)

Puffin Island is a wilderness island located to the east of Matia Island and 7.346 acres in size. The Puffin Island Shoal Light "19" navigational aid is located here. Its habitat consists of rocky shoreline, cliffs, herbaceous bald, and woodlands. Vegetation noted here includes Douglas fir, willow, wild rose, oceanspray, snowberry, Himalayan blackberry, and grasses. The 2009 survey found harlequin ducks, glaucous-winged gulls, and black oystercatchers. Also harbor seals with pups and an immature bald eagle were present in 2009. Bald eagles, black oystercatchers, harlequin ducks, harbor seals, pelagic cormorants, and pigeon guillemots were present between 2000 and 2004.

79. Turn Island — 48° 31' 59" N, 122° 58' 18" W

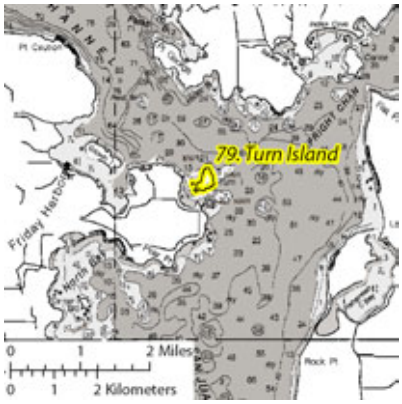



Photo by WA Dept. of Ecology (2006)


Photo by Khem So/USFWS (2007)

Turn Island is a 32.96 acre non-wilderness island located 300 yards east of San Juan Island. The island is underlain with consolidated rock excepting the southwestern extremity, where the shoreline is fringed with glacial drift. The habitat of this island includes dry Douglas-fir-(Madrone) forest and woodland, herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. Tree species observed here include Douglas fir, madrone, shore pine, Rocky Mountain juniper, and Garry oak. In 2009 glaucous-winged gulls, great blue herons, and American crows were present on the island. Between 2000 and 2004 bald eagles, rhinoceros auklets, and raccoons were noted here.

80. Four Bird Rocks — 48° 29' 8" N, 122° 45' 42" W

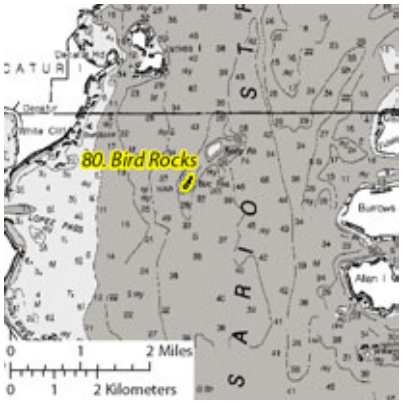



Photo by Khem So/USFWS (2007)


Photo by WA Dept. of Ecology (2006)

Four Bird Rocks is a wilderness group located in the Rosario Strait, east of Decatur Island. They total 3.328 acres. The navigational aid Belle Rock Sector Light is located northeast of, but not on, the refuge islands. The habitat of this group is identified as rocky shoreline. Wildlife present in 2009 included pigeon guillemots, pelagic cormorants, Heermann's gulls, double-crested cormorants, and black oystercatchers. Wildlife present with nests and young in 2009 included glaucous-winged gulls. Brant's cormorants were present with nests. Harbor seals were also present with young. From 2000 to 2004 black oystercatchers, Brandt's cormorants, double-crested cormorants, glaucous-winged gulls, harlequin ducks, harbor seals, pelagic cormorants, and pigeon guillemots were observed.

81. Three Williamson Rocks — 48° 26' 59" N, 122° 42' 21" W

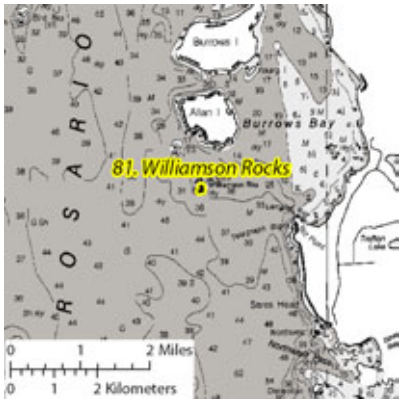



Photo by Khem So/USFWS (2007)

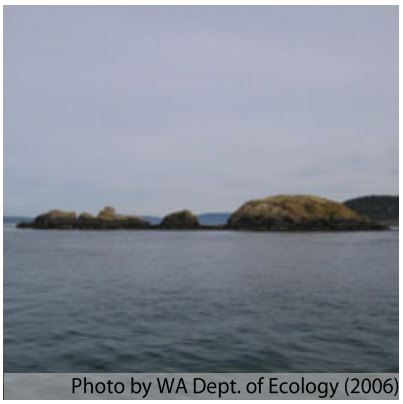


Photo by WA Dept. of Ecology (2006)

Williamson Rocks are a wilderness group located south of Allan Island that total 1.55 acres in size. The Williamson Rocks Lighted Gong Buoy "4" navigational aid is south of, but not on, the refuge islands. The habitat here is rocky shoreline. Wildlife present in 2009 included surf birds, pigeon guillemots, Heermann's gulls, harbor seals, double-crested cormorants, Brant's cormorants, and black oystercatchers. Pelagic cormorants and glaucous-winged gulls were both present with young and nests in 2009. Between 2000 and 2004 black oystercatchers, double-crested cormorants, glaucous-winged gulls, harbor seals, pelagic cormorants, and pigeon guillemots were present.

82. Colville Island — 48° 24' 55" N, 122° 49' 22" W

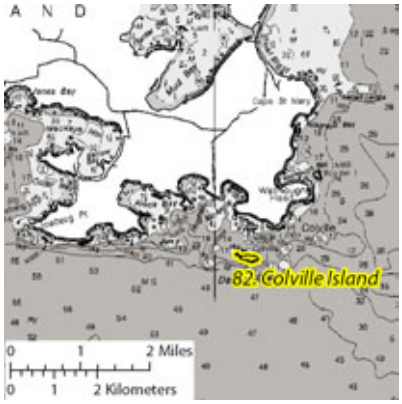


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

Colville Island is a wilderness island located south of Lopez Island. It is 11.632 acres. The habitat of this island is rocky shoreline and herbaceous bald. Wildlife present here in 2009 included turkey vultures, pigeon guillemots, glaucous-winged gulls, and black oystercatchers, along with harbor seals and their pups. Black oystercatchers, double-crested cormorants, harbor seals, and pigeon guillemots were found between 2000 and 2004.

83. Buck Island — 48° 27' 8" N, 122° 55' 17" W

Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

Buck Island is a wilderness island located south of Lopez Island. It is 1.302 acres. Its habitat consists of rocky shoreline and herbaceous bald. Wildlife found on this island in 2009 included pigeon guillemots and harlequin ducks. Black oystercatchers, double-crested cormorants, harbor seals, and pigeon guillemots were observed between 2000 and 2004.

84. Bare Island 48° 43' 47" N, 123° 0' 52" W

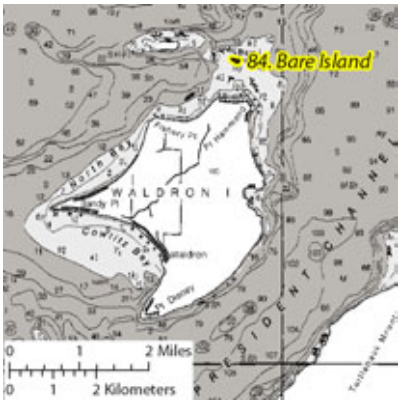


Photo by Khem So/USFWS (2007)

Photo by WA Dept. of Ecology (2006)

Bare Island is a wilderness island located north of Waldron Island and is 2.091 acres. Habitat here includes herbaceous bald, rocky shoreline, and sandy, gravelly shoreline. In 2009 pigeon guillemots, pelagic cormorants, Heermann's gulls, great blue herons, double-crested cormorants, black turnstones, black oystercatchers, and bald eagles were present on the island. Harbor seals and glaucous-winged gulls were present with young in 2009. Between 2000 and 2004 black oystercatchers, double-crested cormorants, harbor seals, pelagic cormorants, and pigeon guillemots were present.

Appendix C. Habitats and Wildlife

C. Introduction

In preparing this plan, the Service reviewed other local, regional, and national plans that pertain to the wildlife and habitats of Protection Island and San Juan Islands NWRs. The Service also sought input from Washington State conservation agencies, non-governmental organizations, and the general public. Refuge purposes, as stated in the enabling legislation for each refuge, were carefully reviewed, as were the refuges' contributions to maintenance of Biological Integrity, Diversity, and Environmental Health (BIDEH) within the ecoregion. As a result of this information gathering and review process, a comprehensive list of resources of concern (Section C.1) was developed. From this list, those species and habitats that are most representative of refuge purposes and habitats, BIDEH, as well as other Service and ecosystem priorities, were chosen as priority resources of concern (habitat types) and focal resources (plant and animal species) (presented in Section C.2). BIDEH considered as Priority Resources of Concern are listed below in Section C.3. Important elements of BIDEH are presented according to *A Marine and Estuarine Habitat Classification System for Washington State* (Dethier 1990) and classified by vegetation type descriptions according to the International Terrestrial Ecological System Classification under development by NatureServe and its natural heritage program members in Section C.4. The last section (C.5) in this appendix contains the common and scientific names of plant and animals species mentioned in the entire CCP.

Comprehensive List of Resources of Concern for Protection Island and San Juan Islands NWRs

Potential Resources of Concern Considered	PI Purposes	SJI+PI Purposes Mig bird[1]	Fed. ESA Status[2]	State Status[3]	State Rank WNHP[4]	MMPA species[5]	USFWS Bird of Mgt. Concern or Bird of Conservation Concern[6]	Pacific Reiton Seabird Plan[7]	N Pacific Coast Shorebird Plan[8]	WA CWCP Priorities[9]	WPG EA Tar.[10]	Refuge Occurance	Ecological Significance	Selection
SEABIRDS														
Rhinocerous Auklet	√	√			S4B S4N			HC			√	breeding colonies on PI and Smith Island (SJI)	3rd largest colony in NA on PI	selected
Tufted Puffin	√	√	SC	C	S3S4B, S4N			MC		√	√	breeding colonies on PI and Smith Island (SJI)	Federal Species of Concern; State Candidtate. PI and Smith represent last known breeding colonies in SJI/Puget Sound	selected
Pigeon Guillemot	√	√			S4B S4N			MC			√	widely spread nesting colonies on the Refuges	represents 30-40% of SJ/Puget Sound breeding pop.	selected
Pelagic Cormorant	√	√			S4B,S4N		BCR5	HC			√	nests on PI and selected islands in SJI, roosts on additional islands	refuges provide undisturbed breeding sites for this species that is frequently harassed.	selected
Glaucous-winged/ Western Gulls		√			S5B, S5N S4B,S4N		NAR				√	large colony on PI -breeds on select islands in SJI.	PI supports one of the largest colonies in the Salish Sea and other large colonies on SJI	selected
Marbled Murrelet		√	T	T	S3		T/E	HC		√	√	not observed on the refuges but forage in waters around the refuges	Federal and State Threatened species; refuge islands not ecologically significant to this species	not selected because species does not use the refuges
Double-crested Cormorant	√	√			S4S5B			NAR			√	nests on PI and select islands in SJI, roosts on additional islands	refuges provide undisturbed breeding sites for this species that is frequently harassed.	selected, colonies in BC and WA have declined (USFWS 2005-seabird plan)
Brandt's Cormorant		√	C		S3B,S4N			MC			√	very rare breeding, primarily non-breeding roosts		not selected habitat needs will be met by management for other cormorants
Heermann's Gull	√		S5N					MC		√		summer/fall migrant throughout SJI		not selected
Caspian Tern		√	M		S3B		BCR5	MC			√	none, possible nesting habitat on PI and Smith/Minor Islands	Low potential for alternate breeding colony sites.	not selected
Arctic Tern		√	M		S2B		BCR5	MC		√	√		Low potential for alternate breeding colony sites.	not selected
Brown Pelican		√	SC	E	S3N		HC				√	transient - rare fall use of shorelines	Federal Species of Concern; State Endangered	not selected
SHOREBIRDS														

Potential Resources of Concern Considered	PI Purposes	SJI+PI Purposes Mig bird[1]	Fed. ESA Status[2]	State Status[3]	State Rank WNHP[4]	MMPA species[5]	USFWS Bird of Mgt. Concern or Bird of Conservation Concern[6]	Pacific Retion Seabird Plan[7]	N Pacific Coast Shorebird Plan[8]	WA CWCP Priorities[9]	WPG EA Tar.[10]	Refuge Occurance	Ecological Significance	Selection
Black Oystercatcher		√		M	S4		N, R1, BCR5		4	√	√	Refuges provide important habitat year round. Many of the refuge rocks and islands have breeding pairs.	indicator species, high conservation priority, refuges support a high percentage of breeding birds	selected
Black Turnstone		√			S4$5N				4		√	migrant/winter on PI and most SJI	refuge does not support a significant portion of the population.	not selected
Ruddy Turnstone		√			S4N				4		√	migrant	refuge does not support a significant portion of the population.	not selected
Surfbird		√			S4N		4				√	migrant/winter on PI and most SJI	refuge does not support a significant portion of the population.	not selected
Rock Sandpiper		√			S3N		N 3			√	√	migrant/winter	refuge does not support a significant portion of the population.	not selected
Wandering Tattler		√			S3N		3				√	migrant	refuge does not support a significant portion of the population.	not selected
Black bellied Plover		√			S4N		3				√	migrant/winter	refuge does not support a significant portion of the population.	not selected
Sanderling		√			S4N		4				√	migrant/winter	refuge does not support a significant portion of the population.	not selected
Dunlin		√			S4$5N				3		√	migrant/winter	refuge does not support a significant portion of the population.	not selected
Western Sandpiper		√			S4$5N				3		√	migrant	refuge does not support a significant portion of the population.	not selected
Killdeer		√			S4$5B S4S5N		3				√	breeding	refuge does not support a significant portion of the population.	not selected
WATERFOWL														
Black Brant		√			S3N		GBBD C			√	√	migrant/winter - PI, Smith, possible on other islands		not selected
Harlequin Duck		√			S2B,S3N		GBBD C				√	year round, molting, migration to Smith, PI	medium priority in Sea duck plan	not selected
Mallard		√			S5B,S5N		GBBD C					year-round	refuge does not support a significant portion of the population.	not selected

Potential Resources of Concern Considered	PI Purposes	SJI+PI Purposes Mig bird[1]	Fed. ESA Status[2]	State Status[3]	State Rank WNHP[4]	MMPA species[5]	USFWS Bird of Mgt. Concern or Bird of Conservation Concern[6]	Pacific Retion Seabird Plan[7]	N Pacific Coast Shorebird Plan[8]	WA CWCP Priorities[9]	WPG EA Tar.[10]	Refuge Occurance	Ecological Significance	Selection
Canada Goose ssp moffita & maxima		√			S5B,S5N							year-round	introduced residents	not selected
OTHER WATERBIRDS														
Great Blue Heron		√		M	S4S5B S5N					√		year-round	not	selected
RAPTORS														
Bald Eagle	√	√	SC	S	S4B S4N		N, R1, BCR5			√		~ 10+ territories encompas refuges, immatures, common throughout the year, abundant spring - August.	Refuge purpose species; high conservation priority dispite recent delisting;	selected
Peregrine Falcon ssp *peals*		√	SC	S	S2B S3N		N, R1, BCR5			√		forages on the refuges, Observed almost daily during the breeding season off of PI.	Federal Species of Concern; State Sensitive thought refuges do not support a nest	not selected
Great-horned Owl		√			S5							1-2 pr. breeding on PI		not selected
Short-eared Owl		√			S2S3B S3N		N, R1					former breeding on PI, current status unknown		not selected
Snowy Owl		√		M	S3N							eruptive species present on PI in some years during the winter		not selected
Northern Harrier		√			S3B S3N							2004 last known active breeding on PI		not selected
American Kestrel		√			S4S5B							1 pr.breeding on PI		not selected
OTHER LANDBIRDS														
Streaked Horned Lark	√		C	E	S1B		N, R1, BCR5			√		Small remnant pop. In Puget sound - not observed on refuges	Federal Candidate; State Endangered, though very limited habitat on refuges - sp experts believe PI size too limited	not selected
Purple Martin	√	√		C	S3B					√		very limited breeding on PI	very few breeding pairs in WA - citizen recovery effort	not selected
Savanna Sparrow		√			S4N,S5B							breeding on PI	common species	not selected
MARINE MAMMALS														
Steller Sea Lion			T	T	S2N	√				√	√	Observed in low numbers during the nonbreeding period	Threatened and MMPA species	selected
CA Sea Lion					SNA	√					√	Observed during the nonbreeding period	MMPA species	selected
Elephant Seal					SNA	√						Breeding, pupping, molting on PI	MMPA species; recolonizing refuges	selected
Harbor Seal	√		M	S	4	√					√	Abundant species observed on almost all refuge islands during breeding and non breeding periods	MMPA species	selected
Sea otter				E	S2S3	√				√		Very few sightings historically in waters off refuge		not selected
OTHER MAMMALS														

Potential Resources of Concern Considered	PI Purposes	SJI+PI Purposes Mig bird[1]	Fed. ESA Status[2]	State Status[3]	State Rank WNHP[4]	MMPA species[5]	USFWS Bird of Mgt. Concern or Bird of Conservation Concern[6]	Pacific Retion Seabird Plan[7]	N Pacific Coast Shorebird Plan[8]	WA CWCP Priorities[9]	WPG EA Tar.[10]	Refuge Occurance	Ecological Significance	Selection
Northern River otter					S4							Year-round on PI, many observations in SJI	not	selected
Black-tailed Deer					S5							Feb, 2010 count of 71 deer on PI; observations noted in the SJI at all times of year	very high densities on PI are beginning to affect seabird breeding habitat	not selected
AMPHIBIANS AND REPTILES														
garter snake 3spp					S5							On PI and Matia.	Study indicated PI species are genetically different	not selected
western toad				C	S3					√		none known on refuges, despite limited surveys (Matia)		not selected
INSECTS														
Valley silverspot, *Speyeria zerene bremerii*			SC	C	S2S3					√		no known occurrence but potential habitat in SJI	Federal Species of Concern; State Canditate	not selected
Island Marble, *Euchloe ausonides insulanus*			SC	C	S1					√		no known occurrence but potential habitat in SJI	Federal Species of Concern; State Canditate	not selected
Taylor's Checkerspot			C	E	S1					√		no known occurrence but potential habitat on PI	Federal Candidate; State Endangered - second largest population in the state found on nearby Miller Penninsula.	not selected
RARE PLANT SPECIES														
Castilleja levisecta, (golden paintbrush)			T	E	S1							none found on refuges but refuge lands might provide suitable habitat	Threatened Species	selected
Opuntia fragilis (brittle prickly-pear cactus)				E	SNR							SJI (Castle, Rum, Aleck, Fortress); historically on PI	State Endangered Species	selected
Ranunculus californicus (California buttercup)				E	S1							SJI (Aleck and Castle)	State Endangered Species	selected
Sanicula arctopoides (bear's foot sanicle)			SC	E	S1							SJI (Boulder)	State Endangered Species	selected
Boschniakia hookeri (Vancouver groundcone)				R1	S3							Found on PI only		not selected
Oxytropis campestris var. gracilis (slender crazyweed)				S	S2							SJI (Swirl)		not selected
Puccinellia nutkaensis (Alaska alkaligrass)				S	S2							SJI (Swirl Rock, Secar, island w of Castle)		not selected

Potential Resources of Concern Considered	PI Purposes	SJI+PI Purposes Mig bird[1]	Fed. ESA Status[2]	State Status[3]	State Rank WNHP[4]	MMPA species[5]	USFWS Bird of Mgt. Concern or Bird of Conservation Concern[6]	Pacific Retion Seabird Plan[7]	N Pacific Coast Shorebird Plan[8]	WA CWCP Priorities[9]	WPG EA Tar.[10]	Refuge Occurance	Ecological Significance	Selection
ECOLOGICAL SYSTEMS														
Shoreline											√	Shoreline common to all refuge islands consisting of spit, sandy/gravel, rocky or rocky cliff habitats	very important marine ecosystem component	selected
Sandy Bluff												Protection and Smith islands	important habitat for rhinoceros auklet nesting in the Salish Sea	selected
Grasslands,Savannas and Herbaceous Bald										√		Protection, Smith and select SJI	native praires are rare	selected
Forests and Woodland											√	old-growth stand on Matia Island (in SJI), smaller and younger stands on a few other islands in SJI and PI; Garry oak on Turn Island (in SJI) and possibly other islands	very little old growth left; Garry oak is a severely declined veg type	selected
Wetland											√	Currently no more than 1 ac of wetlands consisting of: 1 freshwater wetland on Matia Island and 1 brackish wetland on Smith. PI supported a brackish wetland prior to construction of the marina, however that wetland no longer exists	ucommon on islands within the Salish Sea	selected

1 Cited in the Refuge Puporse
2 Status under the Endangered Species Act - E = Endangered; T = Threatened; C = Candidate; SC = Species of Concern
3 State listing status - E = Endangered; T = Threatened; C = Candidate; S = Sensitive; M = Monitor; R1 = More date required to review status
4 Washington Natural Heritage Program state rank - see http://www1.dnr.wa.gov/nhp/refdesk/lists/animal_ranks.html#key for a description of ranks
5 Species listed under the Marine Mammal Protection Act
6 USFWS Bird of Management Concer and Birds of Conservation Concern 2008 lists - N = National; R1 = Region 1; BCR5 = Bird Conservation Region 5; GBBDC -
7 Pacific Region Seabird Conservation Plan status - HC = High Concern; MC = Moderate Concern; NAR = Not at Risk
8 Northern Pacific Coast Regional Shorebird Conservation Plan status - 4 = High Concern; 3 = Moderate Concern
9 Washington Comprehensive Wildlife Conservation Plan priority species
10 Willamette Valley/Puget Trough Ecoregional Assessment Conservation Target

C.2 Protection Island and San Juan Islands NWRs Priority Resources of Concern and Focal Resources

Focal Resources	Habitat Type	Habitat Structure and Other Ecological Requirements	Life History	Other Benefiting Species
Shoreline				
Pelagic Cormorant	Rocky Cliffs	• Human disturbance is minimized near rocky shoreline and cliff habitat used by breeding cormorants, oystercatcher, and marine mammals year-round on all refuge islands. • PI, Smith, Minor shorelines are cleaned of marine debris annually; other San Juan Island NWR shorelines are cleaned once every 5 years on a rotational basis. • No non-native rats or rabbits on any refuge islands. • Reduce impacts from other mammalian predators.	Year-round	Brandt's cormorant, peregrine falcon, swallows
Double-crested Cormorant	Rocky Cliffs	• See Habitat Structure and Other Ecological Requirements for Pelagic Cormorant above.	Year-round	Brandt's cormorant, peregrine falcon, swallows
Pigeon Guillemot	Sandy/Gravel Shoreline	• Continued long shore sandy/gravelly movement and deposition. • Presence of large continuous expanses of driftwood piles with cavities suitable for pigeon guillemot nesting and camouflage of guillemot and oystercatcher chicks. • Remove creosote pilings from marina on Protection Island. • PI and Smith/Minor shorelines are cleaned of marine debris annually. • No non-native rats or rabbits on any refuge islands. • Reduce impacts from other mammalian predators.	Year-round	Harlequin duck, brant, dunlin, western sandpiper, black and ruddy turnstone, surfbird, rock sandpiper, wandering tattler, killdeer, great blue heron, brown pelican, snowy owl, peregrine falcon, river otter, herring, and sand lance
Glaucous-winged Gull	Spit	• Sparse (<30% cover), medium (3-4 foot) grasses. • Vegetation associated with North Pacific Maritime Coastal Sand Dune and Strand. • Natural screens (e.g., driftwood or variation in topography) for concealment from nearest nests are present. • <25% invasive species (e.g., Scotch broom or Spartina grass) on spit habitat. • Eliminate disturbance and impacts from deer. • No non-native rats or rabbits on any refuge islands. • Reduce impacts from mammalian predators. • PI, Smith/Minor shorelines are cleaned of marine debris annually.	Year-round	Heermann's gull, Caspian tern, and snowy owl

Black Oystercatcher	Rocky Shoreline	• Human disturbance on Matia and Turn is minimized during oystercatcher nesting and brood rearing periods (April – Sept). • Plus see Habitat Structure and Other Ecological Requirements for Pelagic Cormorant above.	Year-round	Brant, harlequin duck, black and ruddy turnstone, surfbird, rock sandpiper, wandering tattler, peregrine falcon, brown pelican, great blue heron, river otter
Harbor Seal	Spit, Rocky and Sandy/Gravel Shorelines	• See Habitat Structure and Other Ecological Requirements for Pelagic Cormorant, Pigeon Guillemot, and Glaucous-winged Gull above.	Year-round	Harlequin duck, brant, dunlin, western sandpiper, black and ruddy turnstone, surfbird, rock sandpiper, wandering tattler, killdeer, great blue heron, brown pelican, snowy owl, peregrine falcon, river otter, herring, and sand lance
Elephant Seal	Spit, Rocky and Sandy/Gravel Shorelines	• See Habitat Structure and Other Ecological Requirements for Pelagic Cormorant, Pigeon Guillemot, and Glaucous-winged Gull above.	Year-round	Harlequin duck, brant, dunlin, western sandpiper, black and ruddy turnstone, surfbird, rock sandpiper, wandering tattler, killdeer, great blue heron, brown pelican, Heermann's gull, Caspian tern, snowy owl, peregrine falcon, river otter, herring, and sand lance
Steller Sea Lion	Spit, Rocky and Sandy/Gravel Shorelines	• See Habitat Structure and Other Ecological Requirements for Pelagic Cormorant, Pigeon Guillemot, and Glaucous-winged Gull above.	Non-breeding	Brant, harlequin duck, black and ruddy turnstone, surfbird, rock sandpiper, wandering tattler, peregrine falcon, brown pelican, great blue heron, river otter
California Sea Lion	Spit, Rocky and Sandy/Gravel Shorelines	• See Habitat Structure and Other Ecological Requirements for Pelagic Cormorant, Pigeon Guillemot, and Glaucous-winged Gull above.	Non-breeding	Brant, harlequin duck, black and ruddy turnstone, surfbird, rock sandpiper, wandering tattler, peregrine falcon, brown pelican, great blue heron, river otter

Sandy Bluffs				
Rhinoceros Auklet	Sandy Bluffs	• > 75% of the vegetation is composed of species associated with the Willamette Valley Upland Prairie and Savanna and North Pacific Coastal Cliff and Bluff ecological systems. • At least 50% vegetative cover at the beginning of the rainy season. • <25% invasive plant species (e.g., cheat grass). • No Scotch broom or other invasive shrub species. • Eliminate disturbance and impacts to habitats from deer. • No non-native rats or rabbits. • Reduce impacts from other mammalian predators.	Breeding	Canada goose and snowy owl
Tufted Puffin	Sandy Bluffs	• See Habitat Structure and Other Ecological Requirements for Rhinoceros Auklet above.	Breeding	Canada goose, swallows, snowy owl
Savanna, Grassland, and Herbaceous Bald				
Golden Paintbrush	Grassland	• <15-20% canopy cover of trees and native shrubs. • >50% cover of native grasses and native forbs of the Willamette Valley Upland Prairie and Savanna ecological system. • <25% cover of non-native plant species. • <10% cover of invasive plant species. • No presence of English ivy, Scotch broom, or other new noxious weed invaders. • Eliminate disturbance and impacts to habitats from deer and rabbits.	Year-round	Northern harrier, American kestrel, short-eared owl, streaked horned lark, swallows, purple martin, savanna sparrow, black-tailed deer, valley silverspot, island marble, Taylor's checkerspot
Brittle Prickly-pear Cactus	Grassland and Sandy Bluffs	• See Habitat Structure and Other Ecological Requirements for Golden Paintbrush above.	Year-round	See species listed for golden paintbrush above, plus Canada goose, swallows, snowy owl
California Buttercup	Grassland and Sandy Bluffs	• See Habitat Structure and Other Ecological Requirements for Golden Paintbrush above.	Year-round	See species listed for brittle prickly-pear cactus
Bear's Foot Sanicle	Grassland and Sandy Bluffs	• See Habitat Structure and Other Ecological Requirements for Golden Paintbrush above.	Year-round	See species listed for brittle prickly-pear cactus

Forests and Woodlands				
Bald Eagle	Forests and Woodlands	• >25% canopy cover of trees (e.g., Douglas-fir, madrone, Garry Oak, lodgepole pine) of the North Pacific Douglas-Fir Forest and Woodland and the North Pacific Maritime Dry Mesic Douglas-fir -Western hemlock Forest. • >50% cover of native shrubs (e.g., ocean spray, Nootka rose) in understory. • <10% cover of invasive plant species (e.g., Himalayan blackberry and Evergreen blackberry). • Forest patches are connected. • No presence of English ivy, English holly, Scotch broom, Dalmatian toadflax, garlic mustard, or other new noxious weed invaders. • Eliminate disturbance and impacts to habitats from deer. • No non-native rats or rabbits. • Reduce impacts from other mammalian predators.	Year-round	Downy, hairy, and pileated woodpeckers, olive-sided flycatcher, American kestrel, great horned owl, and bats
Wetlands				
Biological Integrity	Wetlands	• No invasive aquatic species (e.g., green crab or spartina). • No non-native rats or rabbits on any refuge islands. • Reduce impacts from other mammalian predators.	Year-round in brackish water; potentially seasonal in freshwater	Heermann's gull, Brant, harlequin duck, black and ruddy turnstone, surfbird, rock sandpiper, wandering tattler, great blue heron, river otter, dunlin, western sandpiper, northern pintail, mallards, Canada geese, amphibians, and bats

Definitions for Column Headings:

Focal Resources: Species selected as representatives or indicators for the overall condition of the Priority Resources of Concern. In situations where the Priority Resources of Concern may include a broad variety of habitat structures and plant associations, several different focal resources may be listed. In addition, species with specific "niche" ecological requirements may be listed as focal resources. Management will be focused on attaining conditions required by the focal resources.

Habitat Type: The general habitat description utilized by the focal resource.

Habitat Structure and Other Ecological Requirements: The specific and measurable habitat attributes considered necessary to support the focal resource.

Life History: The general season of use for the focal resources.

Other Benefiting Species: Other species that are expected to benefit from management for the selected focal resources. The list is not comprehensive; see the *Table of Potential Resources of Concern for the Refuges* for a more complete list.

C.3 Summary of BIDEH for Protection Island and San Juan Islands NWRs

Habitats that Represent Existing BIDEH	Population/Habitat Attributes (age, class, structure, serial, species composition)	Natural Processes Responsible for These Conditions	Limiting Factors
Shoreline			
Spit	North Pacific Maritime Coastal Sand Dune and Strand ecological system. Sand and gravelly sediment from adjacent bluffs form a low elevation (<3' above mean high tide) point of land or narrow shoal projecting into the marine water. American dune grass, yellow sandverbena, plantain, yarrow, black knotweed	Eroding glacial-till bluffs; salt spray; high winds; excessively drained soils	Sea level rise; high waves and storm intensity; armoring bluffs; invasive species; lack of large driftwood, contamination
Rocky Shoreline and Cliff	Basalt or meta-sedimentary consolidated rock with or without minimal soil. Native lichen/sedum dominated vegetation sparsely interspersed with windswept shrubs, succulents, or grasses growing from fissures	Volcanic and tectonic activities; glacial processes; and mean sea level	Sea level raise; volcanic and tectonic activity; wind, waves, and other erosive forces; invasive spp.
Sandy/Gravel Shoreline	The stratum consists of components smaller than cobble (10" diameter) including gravel, sand mud, and organic materials. If vegetation is present, represents the North Pacific Maritime Coastal Sand Dune and Strand ecological system though very sparse	Eroding glacial-till bluffs; salt spray; high winds; excessively drained soils; volcanic and tectonic activities, glacial processes; and mean sea level	Sea level rise; high waves and storm intensity; armoring bluffs; invasive species; lack of large driftwood; contamination; volcanic and tectonic activity
Forest and Woodlands			
Forests	Westside Lowlands Conifer-Hardwood (Mature) Forest ecological system consisting of late-succession (>300 years old) Douglas-fir, western hemlock, western red cedar forest with muti-layer canopy and understory of sword fern, dwarf Oregon grape, and salal.	Configuration of islands (interior buffered by rock ledges) created a deposition area for well-developed soils and increased retention of precipitation	Invasive species; logging; development (trails, campsites); fire; disease; and extreme winds.
Woodlands	Westside Oak and Dry Douglas-fir Forest and Woodlands includes dry Douglas-fir forests, Pacific madrone /Douglas-fir/ Grand fir forests, and areas of lodgepole (shore) pine. Garry oak currently or historically present.	Drained soils; low precipitation; natural fire regimes	Lack of seed dispersing animals and birds, such as Steller's jay; disease; invasive species; fire suppression; climate change

Habitats that Represent Existing BIDEH	Population/Habitat Attributes (age, class, structure, serial, species composition)	Natural Processes Responsible for These Conditions	Limiting Factors
Sandy Bluffs			
	The North Pacific Coastal Cliff and Bluff ecological system.	Deposition of glacial-till; well-drained soils; natural fire regimes	Erosion; invasive species; increasing storm events in combination with sea level rise accelerating natural erosion
Savanna, Grassland, and Herbaceous Bald			
Willam	ette Valley Upland Prairie and Savanna and North Pacific Herbaceous Bald and Bluff ecological systems with native plants, such as camas and Roemer's fescue.	Drained soils; low precipitation; natural fire regimes	Invasive species; grazing and soil disturbance; dune stabilization and agricultural use (seeding of non-natives); roads and structures; fire suppression; climate change
Small Wetlands			
	Temperate Pacific Freshwater Emergent Marsh with the predominant vegetation of cattails, slough sedge, and duckweed; North Pacific Coastal Interdunal Wetland fringed by pickleweed and other salt-tolerant wetland species.	Semipermanent to seasonal flooding, muck or mineral soil, and high-nutrient water; deflation plain and swales of larger active and stabilized sand spits receives freshwater input from precipitation runoff and few seeps and limited saltwater intrusion from storm or high tide over wash events.	Level of the water table; amount of salt water intrusion; alteration of precipitation patterns and sea level raise as a result of climate change

C.4. Shoreline Habitat and Ecological Systems Descriptions

C.4.1 Shoreline Habitat Descriptions

Physical attributes for the shoreline areas were characterized according to *A Marine and Estuarine Habitat Classification System for Washington State* (Dethier 1990), a hierarchical system based on the National Wetland Inventory classification (Cowardin et al. 1979).

Overview of *A Marine and Estuarine Habitat Classification System for Washington State* (Dethier 1990).

System Subs	ystem	Class	Subclass	Energy	Water Regime
Marine Int	ertidal	Consolidated	Bedrock		
	B		oulder	Exposed	
			Hardpan		
		Unconsolidated	Cobble		Eulittoral
	M		ixed Coarse	Partially Exposed	
			Gravel		
	Sand				
	M		ixed Fine	Semi-protected	
			Mud		Backshore
	Or		ganic		
		Reef		Protected	
		Artificial			
Su	btidal	Consolidated	Bedrock		
	B		oulder		
			Hardpan	High	
		Unconsolidated	Cobble		Shallow
	M		ixed Coarse		
			Gravel	Moderate	
	Sand				
	M		ixed Fine		
			Mud		Deep
	Or		ganic		
		Reef		Low	
		Artificial			
Estuarine In	tertidal	Consolidated	Bedrock		
	B		oulder	Open	
			Hardpan		
		Unconsolidated	Cobble		Eulittoral
	M		ixed Coarse	Partly Enclosed	
			Gravel		
	Sand				
	M		ixed Fine	Lagoon	
			Mud		Backshore
	Or		ganic		
		Reef		Channel/Slough	
		Artificial			
Su	btidal	Consolidated	Bedrock		Shallow
	B		oulder		
			Hardpan		
		Unconsolidated	Cobble		
	M		ixed Coarse		

System Subs	ystem	Class	Subclass	Energy	Water Regime
			Gravel		Deep
	Sand				
	M		ixed Fine		
			Mud		
	Or		ganic		
	Reef				
	Artificial				

Using the results of the WDNR Nearshore Habitat Program's ShoreZone Inventory (Berry et al. 2001, WDNR 2001) and Puget Sound Intertidal Habitat Inventory (Berry and Ritter 1997, Ritter et al. 1999) in combination with field reconnaissance and photo-interpretation of oblique and orthorectified aerial photographs (So 2009), shoreline characteristics for the refuges were described at the following classification levels: System, Subsystem, Substrate, Energy, and Water Regime.

System-level categorization of each island as either Estuarine or Marine is difficult since salinities are generally high (>25 ppt) and the flora and fauna resemble those on the marine outer coast. However, the strong influences of the Fraser River from the north and the freshwater runoff into Bellingham, Padilla, and Skagit Bays from the east lead to occasional large drops in surface salinities. Consequently, the Dethier (1990) classification system arbitrarily considers areas to the east of a line from Green Point (Fidalgo Island) to Lawrence Point (Orcas Island) as well as all of the Strait of Georgia and the San Juans north of Orcas as Estuarine. Areas to the west of this line are considered Marine.

Rocky (consolidated) shoreline:

Rocky shoreline habitat descriptions adapted from Dethier (1990), Bailey et al. (1993) and Don (2002) follow:

Habitat Type	Marine: Intertidal: Consolidated: Bedrock: Partially Exposed: Eulittoral
Refuge Units	8, 9, 11, 14, 15, 16, 17, 18, 19, 20, 21, 27, 28, 80, 81, 82
Description	Sites not directly exposed to oceanic swell but with substantial wave action. Wave energies are less but there is a consequent increase in desiccation and other stresses leading to somewhat lower diversities than at the most exposed sites. Low tides on the more inland waters also fall at highly stressful hours (nearer midday in the summer and midnight in the winter), contributing to lower diversities. Diagnostic species include the kelp *Hedophyllum sessile*, the surfgrass *Phyllospadix scouleri*, and the chiton *Katharina tunicata* (all low zones), and the cloning anemone *Anthopleura elegantissima* (mid zone).

Habitat Type	Marine: Intertidal: Consolidated: Bedrock: Protected and Semi-protected: Eulittoral
Refuge Units	Protected: 2, 3, 4, 5, 10, 26, 29, 50, 51, 52, 54, 55, 57, 61, 68, 69, 70, 71, 72, 73, 74, 79 Semi-protected: 6, 10, 12, 13, 22, 23, 24, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 42, 43, 58, 59, 60, 62, 63, 64, 79, 83, 84
Description	Areas that receive neither oceanic swell nor extensive wind fetch but retain their rocky character due to steepness of the shore or currents that sweep away most sediment. Siltation, desiccation, and temperature stresses all take their toll on rocky-shore organisms in these areas, and diversity is correspondingly relatively low. Diagnostic species include the brown rockweed *Fucus gardneri* (=*distichus*), the red algae *Porphyra spp.* and *Mastocarpus papillatus*, the snails *Littorina spp.* (all high zones), and the whelk *Nucella lamellosa*.

Habitat Type	Marine: Intertidal: Consolidated: Boulders: Partially Exposed and Semi-protected: Eulittoral
Refuge Units	Partially exposed: 81 Semi-protected: 42
Description	Boulder shores generally resemble bedrock shores of similar wave exposures. A few species are more common in boulder fields than on bedrock shores, probably because the bases of boulders provide protection from sun and from predators. These include the red algae *Plocamium cartilagineum* and *Prionitis spp.*, the limpet *Tectura persona*, the shore crab *Hemigrapsus nudus* and the red rock crab *Cancer productus*, the anemones *Metridium senile*, and *Urticina crassicornis*, and several tunicates (especially *Pyura haustor*) and intertidal sponges (*Halichondria panicea*, *Haliclona permollis*, and *Ophlitaspongia pennata*). Characteristic species in the gravel commonly found at the base of boulders include the northern clingfish, porcelain crabs *Petrolisthes spp.*, sipunculid worms, and the polychaete *Thelepus spp*.

Habitat Type	Marine: Subtidal: Consolidated: Bedrock: Moderate energy: Shallow
Refuge Units	7, 25, 33, 41, 49, 56
Description	These habitats, like the rocky intertidal, are productive and diverse. Communities are often patchy, containing areas with herbivorous urchins and few kelps, or no urchins and many kelps. Kelp beds create a semi-protected habitat used as resting areas by gulls, heron, waterfowl, and cormorants, and as feeding sites by surf scoters and white-winged scoters, loons, grebes, goldeneyes, buffleheads, and harbor seals.

Habitat Type	Estuarine: Intertidal: Consolidated: Bedrock: Open: Eulittoral
Refuge Units	47, 48, 66, 77, 78
Description	In the San Juan Islands refuge, these habitats are very similar to their marine counterparts except with higher amount of freshwater dilution. These habitats are exposed to moderate waves or currents which keep silt from settling on the substratum and allow an epifauna to develop. The plants and animals seen on these rocky substrata are largely a freshwater-tolerant subset of those seen on marine shores. These habitats are used at high tide by sculpins and probably other fishes.

Habitat Type	Estuarine: Intertidal: Consolidated: Bedrock: Partially Enclosed: Eulittoral
Refuge Units	45, 46, 65, 77
Description	In the San Juan Islands refuge, these habitats are estuarine equivalents to Marine Intertidal Consolidated Bedrock Semi-protected habitats, except with higher amounts of freshwater dilution. The consolidated bedrock is protected by headlands, bars, or spits which reduce circulation, leading to minimal wave action or currents.

Habitat Type	Estuarine: Subtidal: Consolidated: Bedrock: Moderate energy: Shallow
Refuge Units	44
Description	In the San Juan Islands refuge, these habitats are estuarine equivalents to Marine Subtidal Consolidated Bedrock Moderate energy habitats, except with higher amounts of freshwater dilution.

Unconsolidated (sandy/gravelly) shoreline:

Sandy/gravelly shoreline habitat descriptions adapted from Dethier (1990), Bailey et al. (1993) and Don (2002) follow:

Habitat Type	Marine: Intertidal: Unconsolidated: Mixed-coarse: Partially Exposed: Eulittoral
Refuge Units	75, Protection Island
Description	Mixed-coarse sediments are those where no one grain size occupies more than 70-75 percent of a stretch of beach. Instead, the beach is a mix (in variable quantities) of a few boulders, with cobble, gravel, and sand. Most of the shoreline around Smith Island (especially on the southwest spit) and the north shoreline of Protection Island are composed of a mixed-coarse substrate. Located in the Strait of Juan de Fuca, this shoreline is substantially exposed to wind waves and attenuated oceanic swell.

Habitat Type	Marine: Intertidal: Unconsolidated: Mixed-coarse: Protected and Semi-protected: Eulittoral
Refuge Units	Protected: 1, 6, 10, 15, 29, 38, 53, 54, 70, 73, Protection Island Semi-protected: 13, 62, 64, Protection Island
Description	These habitats are composed of a mix of boulders, cobble, gravel, and sand with no one substratum exceeding 70-75 percent cover. The shoreline is to some degree protected from sea swell and receives moderate to restricted wave action from wind fetch. Drift algae may accumulate in these habitats seasonally, creating anaerobic sediments beneath them but providing food and habitat for a variety of small organisms. On Protection Island, this habitat type occurs within the protected marina on Violet Point, on the north side of Kanem Point, and along the middle portion of the southern shoreline.

Habitat Type	Marine: Intertidal: Unconsolidated: Mixed-fine: Partially Exposed: Eulittoral
Refuge Units	75
Description	The eastern low spit extending away from Smith Island and towards Minor Island is composed of a mixed-fine substrate with sand, mud, and gravel being the most common constituents. Located in the Strait of Juan de Fuca, the shoreline is substantially exposed to wind waves and attenuated oceanic swell.

Habitat Type	Marine: Intertidal: Unconsolidated: Mixed-fine: Protected and Semi-protected: Eulittoral
Refuge Units	Protected: 50, 71, 79 Semi-protected: 35, 39, 64
Description	Protection from waves allows finer sediments to accumulate, and the substratum is relatively stable. The beaches tend to be accretional. The mixed-fine sediments include sand and mud with patches of gravel (especially in the higher intertidal). Species are generally a mix of those found in sand and in mud habitats. Drift algae and seagrass may be abundant.

Habitat Type	Marine: Intertidal: Unconsolidated: Sand: Partially Exposed: Eulittoral
Refuge Units	76
Description	The shoreline of Minor Island is largely composed of sand without significant silt or organic content. Consequently, the shoreline is well-drained, moderately sloped, and unstable nature. They have no permanent vegetation and are low-diversity habitats, although a few species may be abundant. These areas are used extensively by loons, scoters, and grebes at high tide, and by gulls, sanderling and other sandpipers, and herons at low tide.

Habitat Type	Marine: Intertidal: Unconsolidated: Sand: Semi-Protected: Eulittoral
Refuge Units	Protection Island
Description	These sands begin to have some silt mixed in with them and are more stable, making them a more favorable environment for burrowing and for deposit-feeding organisms. These habitats are found in bays and inlets with some wave action, and often are bordered at their upper edges by salt marshes. The shallow water fish and fauna in these habitats provide food for seals and for a variety of local and migratory birds, including mew gulls, grebes, and great blue herons. The clams *Macoma secta*, *Tellina bodegensis* and *Transennella tantilla*, the burrowing sea cucumber *Leptosynapta clarki*, the lugworm *Abarenicola claparedi*, the tanaid crustacean *Leptochelia savignyi*, and sand sole are diagnostic species. Common associates include *Zostera marina*, the sand dollar *Dendraster excentricus* and the moon snail *Polinices lewisii* in low zones. Other species in these sometimes rich assemblages include the ghost shrimp *Callianassa californiensis*, the clams *Tellina modesta*, *Macoma balthica* and others; the polychaetes *Malacoceros glutaeus* (= *Rhynchospio arenincola*), *Axiothella rubrocincta*, *Owenia fusiformis*, and many others. Seines tend to catch *Cancer magister* and *gracilis*, and diverse shrimp, including *Crangon alaskensis*, *Pandalus spp*., and *Heptacarpus brevirostris*. Sole, salmonids, and sculpin (especially Pacific staghorn) feed extensively in these habitats. This is a spawning habitat for surf smelt and is used by larvae of sand lance and candlefish.

Habitat Type	Estuarine: Intertidal: Unconsolidated: Mixed-fine: Open: Eulittoral
Refuge Units	47
Description	In the San Juan Islands refuge, these habitats are estuarine equivalents to Marine Intertidal Unconsolidated Mixed-fine Partially Exposed habitats, except with higher amounts of freshwater dilution. Located in the Strait of Georgia, Lone Tree Island and its associated rocks are exposed to moderate to long fetch and receive some wind waves and/or currents.

Habitat Type	Estuarine: Intertidal: Unconsolidated: Mixed-fine: Partly enclosed: Eulittoral
Refuge Units	77
Description	The pocket beach in the southeast corner of Matia Island consists of mixed sand and mud with small amounts of gravel or with some clay and peat. The substratum is generally stable, firm, and organic-rich. Drift algae and seagrass may be abundant seasonally. Detritivores in the sediment are very dense, and are preyed upon by other invertebrates as well as by numerous birds and fishes. The amphipod *Corophium* provides a major food resource for numerous fish and shorebirds.

Habitat Type	Estuarine: Intertidal: Unconsolidated: Sand: Open: Eulittoral
Refuge Units	77
Description	The beach at Rolfe Cove is a gently to moderately sloping beach with sandy substrata. Drift algae and seagrass may accumulate in high zones seasonally.

Habitat Type	Estuarine: Intertidal: Unconsolidated: Sand: Partly enclosed: Eulittoral
Refuge Units	77
Description	The smaller pocket beaches on Matia Island, excluding the beach at Rolfe Cove and the southeastern beach, are considered partly enclosed. Substrata are sand, silty sand, or gravelly sand.

C.4.2 Ecological Systems Descriptions

Vegetation types and nomenclature in the following section are classified according to the International Terrestrial Ecological System Classification being developed by NatureServe and its natural heritage program members. Ecological systems are being described for the coterminous United States, southern Alaska, and adjacent portions of Mexico and Canada and are defined as follows:

> "Terrestrial ecological systems are specifically defined as a group of plant community types (associations) that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. A given system will typically manifest itself in a landscape at intermediate geographic scales of tens to thousands of hectares and will persist for 50 or more years. This temporal scale allows typical successional dynamics to be integrated into the concept of each unit. With these temporal and spatial scales bounding the concept of ecological systems, we then integrate multiple ecological factors—or diagnostic classifiers—to define each classification unit. The multiple ecological factors are evaluated and combined in different ways to explain the spatial co-occurrence of plant associations." (Comer et al. 2003)

Thus, ecological systems link together recurring groupings of U.S. National Vegetation Classification (US-NVC) associations and alliances (Grossman et al. 1998, Anderson et al. 1998, Jennings et al. 2003) found in similar physical settings and influenced by similar dynamic processes such as fire or flooding. The nested US-NVC hierarchy groups associations into alliances based on common dominant or diagnostic species in the upper most canopy. By non-hierarchically grouping together associations and alliances using larger-scale environmental patterns and concepts, ecological systems form a "meso-scale" classification that lies between the finer-scale (floristic) classes and the generalized formation (physiognomic) levels of the US-NVC (Comer et al. 2003). As a "meso-scale" classification, ecological systems are more readily mapped, identifiable in the field, and practically understood as ecological units

and wildlife habitats. Consequently, regional GAP analysis efforts have generally adopted them as target map units. Given their utility for standardized vegetation type mapping, ecological systems classification was performed for Protection, Matia, Turn, Smith, and Minor Islands.

North Pacific Coastal Sand Dune and Strand:

Coastal dunes include beach strand (not the beach itself but sparsely or densely vegetated areas behind the beach), foredunes, sand spits, and active to stabile backdunes and sandsheets derived from quartz or gypsum sands. The mosaic of sparse to dense vegetation in dune systems is driven by sand deposition, erosion, and lateral movement. Disturbance processes include dune blowouts caused by wind and occasional wave overwash during storm tidal surges. Dune vegetation typically includes herbaceous, succulent, shrub, and tree species with varying degrees of tolerance for salt spray, wind and sand abrasion, and substrate stability. Dune succession is highly variable, so species composition can vary significantly among occurrences. These dunes can be dominated by *Leymus arenarius* (= *Elymus arenarius*), *Festuca rubra*, *Leymus mollis*, or various forbs adapted to salty dry conditions. *Gaultheria shallon* and *Vaccinium ovatum* are major shrub species. Forested portions of dunes are included within this system and are characterized by *Pinus contorta var. contorta* early in succession, *Picea sitchensis* somewhat later in the sere, and in some cases *Tsuga heterophylla* later still (NatureServe 2010).

Coastal Cliff and Bluff:

This ecological system includes unvegetated or sparsely vegetated rock cliffs and very steep bluffs of glacial deposits. It is composed of barren and sparsely vegetated substrates, typically including exposed sediments, bedrock, and scree slopes. Exposure to waves, eroding and desiccating winds, slope failures and sheet erosion create gravelly to rocky substrates that are often unstable. There can be sparse cover of forbs, grasses, lichens, and low shrubs (NatureServe 2010).

Willamette Valley Upland Prairie and Savanna:

This ecological system occurs within the Puget Lowland and Willamette Valley on relatively level terrain, primarily on deep, well-draining gravelly/sandy glacial outwash, and was historically maintained by frequent anthropogenic burning practices (Chappell and Crawford 1997, Crawford and Hall 1997, Chappell et al. 2001a, NatureServe 2010). Grassland structure is more common than savanna (defined here as <30% tree or shrub cover) (Chappell et al. 2001b). Bunch grasses such as Roemer's fescue (*Festuca roemeri = Festuca idahoensis var. roemeri)*, red fescue (*Festuca rubra*), and California oatgrass (*Danthonia californica*) are frequently dominant or co-dominant. Abundant and diverse native forbs are indicative of sites in good condition.

Prior to Euroamerican settlement, Willamette Valley Upland Prairie and Savanna were the dominant landscape features on the glacial outwash soils within the region (Lang 1961). However, the area occupied by this system has declined dramatically due to altered fire regimes, invasion of non-native species, grazing, and urban and agricultural conversion (Giles 1970, Agee 1993, Clampitt 1993, Chappell and Crawford 1997, Crawford and Hall 1997). Remnant grasslands and prairies are typically small fragments that have been degraded by invasive non-native species. Scattered deciduous (*Quercus garryana*) and/or coniferous (*Pseudotsuga menziesii*) trees are rarely found now but formerly formed extensive savannas that covered roughly one-third of the historical ecological system acreage (NatureServe 2010).

North Pacific Herbaceous Bald and Bluff:

This system is characterized by low-growing vegetation, relatively shallow soils with an underlying restrictive layer of bedrock, and relatively dry topographic positions. During the growing season, balds can be moist or wet, but then dry out to an extreme degree late in the growing season. Balds typically

occur in small patches and can be intermixed with rock outcrops and fringed by areas of forest and woodland (Chappell et al. 2001a, Chappell et al. 2001b, Chappell 2006).

Dominant or co-dominant native grasses include Roemer's fescue (*Festuca roemeri = Festuca idahoensis var. roemeri)*, red fescue (*Festuca rubra*), and California oatgrass (*Danthonia californica*), Lemmon's needlegrass (*Achnatherum lemmonii*), and prairie junegrass (*Koeleria macrantha*). Major exotic dominant grasses include brome (*Bromus sp.*), velvet grass (*Holcus lanatus*), wheatgrass (*Agropyron dasystachyum*), and Kentucky bluegrass (*Poa pratensis*). Forb diversity can be high. Some typical co-dominant forbs include common camas (*Camassia quamash*), great camas (*Camassia leichtlinii*), hyacinth triteleia (*Triteleia hyacinthine*), rosy plectritis (*Plectritis congesta*), Martindale's lomatium (*Lomatium martindalei*), nodding onion (*Allium cernuum*), Hooker's onion (*Allium acuminatum*), spreading phlox (*Phlox diffusa*), sea thrift (*Armeria maritima*), and chocolate lily (*Fritillaria lanceolata*) (Atkinson and Sharpe 1993, NatureServe 2010). Important dwarf-shrubs are kinnikinnick (*Arctostaphylos uvaursi*), pinemat manzanita (*Arctostaphylos nevadensis*), and common juniper (*Juniperus communis*). Significant portions of some balds, especially on rock outcrops, are dominated by bryophytes (mosses), and to a lesser degree, lichens (NatureServe 2010).

With the accumulation and enrichment of soil through the actions of erosion and plant matter decay, shrubs and trees scattered may eventually appear within balds forming open savanna-like woodlands. Garry oak (*Quercus garryana*), Rocky Mountain juniper (*Juniperus scopulorum*), and Pacific madrona (*Arbutus menziesii*) are among the tree species able to anchor in the thin soil of these areas. Other tree species which may be found on these sites include Douglas-fir (*Pseudotsuga menziesii*) and shore pine (*Pinus contorta*) (Atkinson and Sharpe 1993).

North Pacific Dry Douglas-Fir Forest and Woodland

The North Pacific Dry Douglas-Fir-(Madrone) Forest and Woodland system occupies dry sites with shallow soils overlying bedrock, very stony soils, or moderately deep, moderately well-drained glacial outwash. These forest and woodland sites tend to be subject to higher winds and higher summer temperatures than the North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest system and also tend to occur on southern or western facing slopes (Chappell et al. 2001).

As the name implies, the North Pacific Dry Douglas-Fir Forest and Woodland ecological system is dominated by the long-lived Douglas-fir tree (*Pseudotsuga menziesii*). A variety of other trees including Pacific madrona (*Arbutus menziesii*), the short-lived shore pine (*Pinus contorta*), big-leaf maple (*Acer macrophyllum*), and the shade-tolerant grand fir (*Abies grandis*) occur along with the Douglas-fir depending on local site conditions (Atkinson and Sharpe 1993, NatureServe 2010). Small amounts of western hemlock (*Tsuga heterophylla*) or Western red cedar (*Thuja plicata*) can be present but are unable to thrive due to the dryness of the site or due to frequent and extensive fires (NatureServe 2010). Deciduous shrubs that dominate or co-dominate the understory include oceanspray (*Holodiscus discolor*), serviceberry (*Amelanchier alnifolia*), trailing blackberry (*Rubus ursinus*), Indian plum (*Oemleria cerasiformis*), Nootka rose (*Rosa nutkana*), and snowberry (*Symphoricarpos albus*). Evergreen shrubs that can sometimes be important in areas that are conifer-dominated include salal (*Gaultheria shallon*) and dwarf Oregon grape (*Mahonia nervosa*). Native graminoids such as blue wildrye (*Elymus glaucus*) commonly dominate or co-dominate the understory. A diversity of forbs is often abundant. However, forbs typically do not dominate (Chappell et al. 2001).

North Pacific Maritime Dry Mesic Douglas-fir-Western Hemlock Forest

This is generally the most extensive forest in the lowlands on the west side of the Cascades and forms the matrix within which other systems occur as patches. In dry areas it occurs adjacent to or in a mosaic with North Pacific Dry Douglas-fir-(Madrone) Forest and Woodland.

Douglas-fir and western hemlock are the most characteristic species of this ecological system and one or both are generally canopy dominant. Other co-dominants include grand fir, western red-cedar, and big-leaf maple. Dominant or co-dominant understory shrub species include salal, dwarf Oregon grape, Pacific rhododendron (*Rhododendron macrophyllum*), twinflower (*Linnaea borealis*), vanilla leaf (*Achlys triphylla*), and evergreen huckleberry (*Vaccinium ovatum*). Vine maple (*Acer circinatum*) is a common co-dominant with one or more of these other species. On mesic sites, sword fern can be co-dominant with one or more of the evergreen shrubs (NatureServe 2010).

North Pacific Oak Woodlands

Within the Puget Trough region, this ecological system is found in small patches on dry sites typically featuring either shallow bedrock or deep glacial outwash soils. The oak-dominated communities comprising this system are strongly associated with a pre-Euroamerican settlement, frequent (every few years) to moderately frequent (once every 50-100 years), low-severity fire regime (Chappell et al. 2001, NatureServe 2010). The vegetation ranges from open woodland to forest. The deciduous broadleaf Garry oak, also known as Oregon white oak (*Quercus garryana*), is the dominant tree species with the coniferous Douglas-fir often being co-dominant. Madrone and lodgepole pine (*Pinus contorta*) are also common associates (WDFW 2005).

In savanna-like open woodlands, the understory is dominated by long-stolon sedge and camas. This community type is most similar in composition to pre-settlement oak savannas (Chappell and Crawford 2007). In the absence of fire, commonly observed successional changes include an increase in conifers, the proliferation of a shrub understory, higher oak densities, and an increasing abundance of non-native annuals and perennials in the understory (Agee 1993, Chappell and Crawford 1997, NatureServe 2010). The increase in woody trees and shrubs includes native species such as Douglas-fir, Oregon grape, snowberry, and manzanita, and non-native species such as Scotch broom (*Cytisus scoparius*).

Temperate Pacific Freshwater Emergent Marsh

Freshwater emergent marshes are characterized by semipermanent to seasonal flooding, muck or mineral soil, and high-nutrient water. Emergent herbaceous graminoids such as *Carex spp.*, *Scirpus spp.*, *Eleocharis spp.*, *Juncus spp.*, and *Typha latifolia* typically dominate. A consistent source of freshwater is essential to the function of these systems (NatureServe 2010).

North Pacific Coastal Interdunal Wetland

North Pacific Coastal Interdunal Wetlands occur in the deflation plain and swales of larger active and stabilized coastal barrier islands, spits, and coastal dunes, ranging from southern Oregon through the Aleutian Islands (NatureServe 2010). These freshwater wetlands form between dunes where wind has scoured the sand down to the water table. Consequently, interdunal wetlands are sustained almost entirely by groundwater and are flooded seasonally or perennially. Because the water table declines to below the bottom of some deflation plains in the dry season (midsummer to early fall), some of these wetlands are seasonal (USGS 2010). Vegetation in interdunal wetlands is variable, depending upon hydrology and geography. The closer the deflation plain or swale is to the nearby waterbody, the higher the likelihood for a hydrologic linkage. For wet dune swales and broad deflation plains, several distinct communities have been reported (Wiedemann 1984). Where deposition of wind-blown sand is heavy and dune migration is active, interdunal wetlands may become uplands when covered by thick sand deposits.

C.5 Common and Scientific Names of Species mentioned in the CCP

The following tables contain the common and scientific names of plants and animals that are mentioned in this CCP.

Plants

Common Name	Scientific Name	Family
Alfalfa	*Medicago sativa*	Fabaceae
Alaska alkali grass	*Puccinellia kamtschatica*	Poaceae
Alaska brome	*Bromus sitchensis*	Poaceae
Alaska oniongrass	*Melica subulata*	Poaceae
American dunegrass	*Leymus mollis*	Poaceae
Bear's foot sanicle	*Sanicula arctopoides*	Apiaceae
Bigleaf maple	*Acer macrophyllum*	Aceraceae
Black lily	*Fritillaria camschatcensis*	Liliaceae
Black medic	*Medicago lupulina*	Fabaceae
Blue wild rye	*Elymus glaucous*	Poaceae
Bracken fern	*Pteridium aquilinum*	Dennstaedtiaceae
Brittle prickly-pear cactus	*Opuntia fragilis*	Cactaceae
Bull thistle	*Cirsium vulgare*	Asteraceae
California buttercup	*Ranunculus californicus*	Ranunculaceae
California oat-grass	*Danthonia californica*	Poaceae
Camas	*Camassia quamash*	Liliaceae
Canada thistle	*Cirsium arvense*	Asteraceae
Cattails	*Typha latifolia*	Typhaceae
Caulerpa	*Caulerpa* ssp. Caulerpace	ae
Cheatgrass	*Bromus tectorum*	Poaceae
Common cordgrass	*Spartina anglica*	Poaceae
Common mustard	*Brassica campestris*	Brassicaceae
Common sow thistle	*Sonchus Oleraceus*	Asteraceae
Common velvet-grass	*Holcus lanatus*	Poaceae
Douglas-fir	*Pseudotsuga menziesii* ssp. *menziesii*	Pinaceae
Douglas maple	*Acer glabrum*	Aceraceae
Eel-grass	*Zostera marina*	Zosteraceae
English ivy	*Hedera helix*	Araliaceae
Erect pygmy-weed	*Crassula connata*	Crassulaceae
European beachgrass	*Ammophila arenaria*	Poaceae
False dandelion	*Nothocalais* ssp. Astera	ceae
Field bindweed	*Convolvulus arvensis*	Convolvulaceae
Garry oak	*Quercus garryana*	Fagaceae
Golden paintbrush	*Castilleja levisecta*	Scrophulariaceae
Grand fir	*Abies grandis*	Pinaceae
Gumweed	*Grindelia integrifolia*	Asteraceae
Hedge mustard	*Sisymbrium officinale*	Brassicaceae
Himalayan blackberry	*Rubus armeniacus*	Rosaceae
Hookedspur violet	*Viola adunca*	Violaceae
Hooker's willow	*Salix hookeriana*	Salicaceae

Common Name	Scientific Name	Family
Idaho fescue	*Festuca idahoensis*	Poaceae
Japanese eelgrass	*Zostera japonica*	Zosteraceae
Japanese kelp	*Undaria pinnatifida*	Alariaceae
Kentucky bluegrass	*Poa pratensis*	Poaceae
Lance-leaved stonecrop	*Sedum lanceolatum*	Crassulaceae
Lemmon's needlegrass	*Achnatherum lemmonii*	Poaceae
Meadow barley	*Hordeum brachyantherum*	Poaceae
Nootka rose	*Rosa nutkana*	Rosaceae
Northern adder's-tongue	*Ophioglossum pusillum*	Ophioglossaceae
Orange honeysuckle	*Lonicera ciliosa*	Caprifoliaceae
Orchard grass	*Dactylis glomerata*	Poaceae
Pacific madrone	*Arbutus menziesii*	Ericaceae
Pacific sanicle	*Sanicula crassicaulis*	Apiaceae
Paintbrush	*Castilleja* ssp.	Scrophulariaceae
Pickleweed	*Salicornia virginica*	Chenopodiaceae
Plantain	*Plantago* ssp.	Plantaginaceae
Prairie junegrass	*Koeleria macrantha*	Poaceae
Quackgrass	*Elymus repens*	Poaceae
Red alder	*Alnus rubra*	Betulaceae
Redcedar	*Thuja plicata*	Cupressaceae
Red fescue	*Festuca rubra*	Poaceae
Ripgut brome	*Bromus diandrus*	Poaceae
Rocky Mountain juniper	*Juniperus scopulorum*	Cupressaceae
Salal	*Gaultheria shallon*	Ericaceae
Sargassum	*Sargassum* ssp. Sargassa	ceae
Scotch broom	*Cytisus scoparius*	Fabaceae
Scouler's willow	*Salix scouleriana*	Salicaceae
Sea blush	*Plectritis congesta*	Valerianaceae
Sea thrift	*Armeria maritime*	Plumbaginaceae
Sharpfruited peppergrass	*Lepidium oxycarpum*	Brassicaceae
Sheep sorrel	*Rumex acetosella*	Polygonaceae
Shore pine	*Pinus contorta* var. *contorta*	Pinaceae
Silver burweed	*Ambrosia chamissonis*	Asteraceae
Slender crazyweed	*Oxytropis campestris* var. *gracilis*	Fabaceae
Slough sedge	*Carex obnupta*	Cyperaceae
Snowberry	*Symphoricarpos albus*	Caprifoliaceae
Sow thistle	*Sonchus arvensis*	Asteraceae
Sword fern	*Polystichum munitum*	Dryopteridaceae
Vancouver groundcone	*Boschniakia hookeri*	Orobanchaceae
Verbena	*Verbena* ssp. Ny	ctaginaceae
Western hemlock	*Tsuga heterophylla*	Pinaceae
White meconella	*Meconella oregana*	Papaveraceae
Yarrow	*Achillea millefolium*	Asteraceae
Yerba buena	*Clinopodium douglasii*	Lamiaceae

Mammals

Common Name	Scientific Name	Family
Bat		Chioptera (order)
Black-tailed deer	*Odocoileus hemionus*	Cervidae
California sea lion	*Zalophus californianus*	Otariidae
Domestic cat	*Felis catus*	Felidae
Domestic dog	*Canis familiaris*	Canidae
European rabbit	*Oryctolagus cuniculus*	Leporidae
Harbor seal	*Phoca vitulina*	Phocidae
Mink	*Mustela vison*	Mustelidae
Northern elephant seal	*Mirounga angustirostris*	Phocidae
Raccoon	*Procyon lotor*	Procyonidae
Rat	*Rattus* spp.	Muridae
Red fox	*Vulpes vulpes*	Canidae
River otter	*Lutra canadensis*	Mustelidae
Short and long-tailed weasel	*Mustela* spp. Mustelidae	
Shrew	*Sorex* spp. Soricidae	
Steller (northern) sea lion	*Eumetopias jubatus*	Otariidae
Townsend's chipmunk	*Tamias (Neotamias) townsendii*	Sciuridae

Birds

Common Name	Scientific Name	Family
American kestrel	*Falco sparverius*	Falconidae
Bald eagle	*Haliaeetus leucocephalus*	Accipitridae
Black-bellied plover	*Pluvialis squatarola*	Charadriidae
Black oystercatcher	*Haematopus bachmani*	Haematopodidae
Black turnstone	*Arenaria melanocephala*	Scolopacidae
Brant	*Branta bernicla*	Anatidae
Brandt's cormorant	*Phalacrocorax penicillatus*	Phalacrocoracidae
Brown pelican	*Pelecanus occidentalis*	Pelecanidae
Canada goose	*Branta Canadensis*	Anatidae
Caspian tern	*Hydroprogne caspia*	Laridae
Common murre	*Uria aalge*	Alcidae
Double-crested cormorant	*Phalacrocorax auritus*	Phalacrocoracidae
Downy woodpecker	*Picoides pubescens*	Picidae
Dunlin	*Calidris alpina*	Scolopacidae
Glaucous-winged gull	*Larus glaucescens*	Laridae
Great blue heron	*Ardea herodias*	Ardeidae
Great horned owl	*Bubo virginianus*	Strigidae
Hairy woodpecker	*Picoides villosus*	Picidae
Harlequin duck	*Histrionicus histrionicus*	Anatidae
Heermann's gull	*Larus heermanni*	Laridae
Killdeer	*Charadrius vociferus*	Charadriidae
Mallard	*Anas platyrhynchos*	Anatidae

Common Name	Scientific Name	Family
Marbled murrelet	*Brachyramphus marmoratus)*	Alcidae
Northern harrier	*Circus cyaneus*	Accipitridae
Northern pintail	*Anas acuta*	Anatidae
Olive-sided flycatcher	*Contopus cooperi*	Tyrannidae
Pelagic cormorant	*Phalacrocorax pelagicus*	Phalacrocoracidae
Peregrine falcon	*Falco peregrinus*	Falconidae
Pileated woodpeckers	*Dryocopus pileatus*	Picidae
Pigeon guillemot	*Cepphus columba*	Alcidae
Purple martin	*Progne subis*	Hirundinidae
Rhinoceros auklet	*Cerorhinca monocerata*	Alcidae
Rock sandpiper	*Calidris ptilocnemis*	Scolopacidae
Ruddy turnstone	*Arenaria interpres*	Scolopacidae
Surfbird	*Aphriza virgata*	Scolopacidae
Sanderling	*Calidris alba*	Scolopacidae
Savannah sparrow	*Passerculus sandwichensis*	Emberizidae
Snowy owl	*Bubo scandiacus*	Strigidae
Swallow		Hirundinidae
Tufted puffin	*Fratercula cirrhata*	Alcidae
Wandering tattler	*Tringa incana*	Scolopacidae
Western sandpiper	*Calidris mauri*	Scolopacidae

Butterflies

Common Name	Scientific Name	Family
Island marble	*Euchloe ausonides insulanus*	Pieridae
Taylor's checkerspot	*Euphydryas editha taylori*	Nymphalidae
Valley silverspot	*Speyeria zerene bremnerii*	Nymphalidae

Fish and Shellfish

Common Name	Scientific Name	Family
Cod	*Gadus* ssp.	Gadidae
European green crab	*Carcinus maenas*	Portunidae
Flounder		Pleuronectidae
Herring	*Clupea pallasii*	Clupeidae
Limpets		Patellogastropoda (order)
Mussels	*Mytilus* ssp.	Mytilidae
Rockfish	*Sebastes* ssp. Scorpaenidae	_____
Salmon	*Oncorhynchus* ssp. Sal	monidae
Sandlance		Ammodytidae
Smelt		Osmeridae

References

Agee, J. K. 1993. Fire ecology of Pacific Northwest forests. Island Press, Washington, D.C.

Anderson, M., P. Bourgeron, M. T. Bryer, R. Crawford, L. Engelking, D. Faber-Langendoen, M. Gallyoun, K. Goodin, D. H. Grossman, S. Landaal, K. Metzler, K. D. Patterson, M. Pyne, M. Reid, L. Sneddon, and A. S. Weakley. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume II. The National Vegetation Classification System: list of types. The Nature Conservancy, Arlington, Virginia, USA. 502 p.

Atkinson, S., and F. A. Sharpe. 1993. Wild plants of the San Juan Islands. The Mountaineers, Seattle, WA.

Bailey, A., Ward, K. & Manning, T. 1993. A Field Guide for Characterizing Habitats Using a Marine and Estuarine Habitat Classification System for Washington State. Olympia, WA: DNR Nearshore Habitat Program.

Berry, H., & Ritter, R. 1997. Puget Sound Intertidal Habitat Inventory 1995: Vegetation and Shoreline Characteristics Classification Methods. Olympia, WA: DNR Nearshore Habitat Program.

Berry, H.D., Harper, J.R., Mumford Jr., T.F., Bookheim, B.E., Sewell, A.T., & Tamayo, L.J. 2001. The Washington State ShoreZone Inventory User's Manual. Olympia, WA: DNR Nearshore Habitat Program.

Chappell, C. 2006. Plant Associations of Balds and Bluffs of Western Washington. Washington Natural Heritage Program, Olympia, WA.

Chappell, C.B., and R.C. Crawford. 1997. Native vegetation of the south Puget Sound prairie landscape. Pages 107-122 *in* P. Dunn and K. Ewing, editors. Ecology and conservation of the South Puget Sound prairie landscape. The Nature Conservancy of Washington, Seattle, Wash.

Chappell, C.B., M.S. Mohn Gee, B. Stephens, R. Crawford, and S. Farone. 2001a. Distribution and decline of native grasslands and oak woodlands in the Puget Lowland and Willamette Valley ecoregions, Washington. Pages 124-139 *in* Reichard, S. H., P.W. Dunwiddie, J. G. Gamon, A.R. Kruckeberg, and D.L. Salstrom, eds. Conservation of Washington's rare plants and ecosystems. Washington Native Plant Society, Seattle, Wash.

Chappell, C.B., R.C. Crawford, C. Barrett, J. Kagan, D.H. Johnson, M. O'Mealy, G.A. Green, H.L. Ferguson, W.D. Edge, E.L. Greda, and T.A. O'Neil. 2001b. Wildlife habitats: descriptions, status, trends, and system dynamics. Pages 22-114 in Johnson, D.H., and T.A. O'Neil, dirs. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State Univ. Press, Corvallis, OR.

Clampitt, C.A. 1993. Effects of human disturbances on prairies and the regional endemic *Aster curtus* in western Washington. Northwest Science 67:163-169.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological Systems of the United States: A Working Classification of U.S. Terrestrial Systems. NatureServe, Arlington, Virginia.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS-79/31.

Crawford, R.C., and H. Hall. 1997. Changes in the south Puget prairie landscape. Pages 11-15 in P. V. Dunn and K. Ewing, editors. Ecology and Conservation of the South Puget Sound Prairie Landscape. The Nature Conservancy, Seattle.

Dethier, M.N. 1990. A Marine and Estuarine Habitat Classification System for Washington State. Washington Natural Heritage Program, Dept. Natural Resources. 56 pp. Olympia, Washington.

Don, C. N. 2002. Evaluation of near-shore buffer zones of the San Juan Islands National Wildlife Refuge relative to their function as a marine protected area. Master's Thesis. School of Marine Affairs. University of Washington. 91pp.

Giles, L. J. 1970. The ecology of the mounds on Mima Prairie with special reference to Douglas fir invasion. M.S. thesis, University of Washington.

Grossman D.H., Faber-Langendoen D., Weakley A.S., Anderson M., Bourgeron P., Crawford R., Goodin K., Landaal S., Metzler K., Patterson K.D., Pyne M., Reid M., and Sneddon L. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume I, The National Vegetation Classification System: development, status, and applications. The Nature Conservancy: Arlington, VA.

Jennings, M., O. Loucks, D. Glenn-Lewin, R. Peet, D. Faber-Langendoen, D. Grossman, A. Damman, M. Barbour, R. Pfister, M. Walker, S. Talbot, J. Walker, G. Hartshorn, G. Waggoner, M. Abrams, A. Hill, D. Roberts, and D. Tart. 2003. Guidelines for describing associations and alliances of the U.S. National Vegetation Classification. The Ecological Society of America, Vegetation Classification Panel, Version 3.0 November 2003. 100 pp. (+ Appendices)

Lang, F. A. 1961. A study of vegetation change on the gravelly prairies of Pierce and Thurston Counties, western Washington. M.S. thesis, University of Washington, Seattle, Wash.

NatureServe. 2010. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 26 February 2010.

Ritter, R.A., Berry, H.D., Bookheim, B.E., & Sewell, A.T. 1999. Puget Sound Habitat Intertidal Inventory 1996: Vegetation and Shoreline Characteristics Classification Methods. Olympia, WA: DNR Nearshore Habitat Program.

United States Geological Survey. 2010. Oregon Wetland Resources. Available URL: http://or.water.usgs.gov/pubs/Html/WSP2425/index.html. Accessed 26 February 2010.

So, K.J. 2009. Protection Island and San Juan Islands National Wildlife Refuges Shoreline Classification metadata. U.S. Fish and Wildlife Service, Oregon Coast National Wildlife Refuge Complex, Newport, Oregon.

Washington Department of Natural Resources Nearshore Habitat Program. 2001. *The Washington State ShoreZone Inventory*. CD-ROM. Olympia, WA: DNR Nearshore Habitat Program.

WDFW. 2005. Washington's Comprehensive Wildlife Conservation Strategy. Washington Department of Fish and Wildlife. Olympia, WA.

Wiedemann, A.M. 1984. The ecology of Pacific Northwest coastal sand dunes: a community profile. US Fish and Wildlife Service Biological Services Program FWS/OBS-84/04. 130 pp.

Appendix D. Sign Plans

D. Introduction

This appendix contains the following two elements:

- Protection Island National Wildlife Refuge Sign Inventory and Maintenance Plan
- San Juan Islands National Wildlife Refuge Sign Inventory and Maintenance Plan

The sign inventory and maintenance plans are intended to guide decisions regarding the type, placement, and maintenance of signs within the refuges. No substantial changes to the current Protection Island NWR signs and protocol are anticipated; however, a number of changes are proposed with this CCP for the San Juan Islands NWR signs.

Protection Island National Wildlife Refuge

Jefferson County, Washington

USFWS - Robinson

Sign Inventory and Maintenance Plan

U.S. Fish and Wildlife Service

August 2010

Protection Island National Wildlife Refuge was established in 1988 through the efforts of local citizens "to provide habitat for a broad diversity of bird species, with particular emphasis on protecting the nesting habitat of the bald eagle, tufted puffin, rhinoceros auklet, pigeon guillemot, and pelagic cormorant; to protect hauling-out area of harbor seals; and to provide for scientific research and wildlife-oriented public education and interpretation" (1). Protection Island NWR and the attached Zella M. Schulz Seabird Sanctuary are closed to the public to protect sensitive seabird nesting habitat. The wildlife-oriented education and interpretation portions of the establishing purpose are therefore focused on activities that can be accomplished off the refuge but nearby. Although it is easy to view wildlife on the Island and in the surrounding waters from outside the 200-yard disturbance buffer, particularly with the aid of binoculars and telescopes, there is currently no formal interpretation program offered by the refuge except for an outdated interpretive panel at John Wayne Marina in Sequim, WA.

Included in the refuge's Comprehensive Conservation Plan is an objective to increase area visitors' knowledge of the refuge and its wildlife by updating/replacing the interpretive panel at John Wayne Marina and installing another panel at a location frequented by recreational boaters (to be determined) in Port Townsend.

The Island lies approximately 2.5 miles north of Diamond Point, a small Jefferson County community, and is due north of the mouth of Discovery Bay. The area is popular for sightseeing cruises, recreational boating, and commercial fishing and crabbing. The area is also known for its wildlife abundance and is a frequent destination for kayakers who present a significant disturbance and trespassing issue due to the shallow draft of their boats and ability to access areas where wildlife is typically unmolested, including sensitive nesting sites.

USFWS – Davis

Protection Island NWR is especially important to seabirds. About 70% of Puget Sound's breeding seabird population nests on the Island. Located near the mouth of Discovery Bay on the southeast side of the Strait of Juan de Fuca, the 316-acre refuge consists of grassland, shrubland, a small upland forest, and a relatively undisturbed shoreline with two sandy spits and extensive glacial-till sandy bluffs that support one of North America's largest colonies of rhinoceros

auklets. In fact, it is typical to see thousands of rhinoceros auklets returning to their burrows to feed their young as the sun sets each evening. Furthermore, Protection Island is considered the "last stand" for breeding tufted puffins in Salish Sea. In addition to seabirds, harbor and elephant seals haul-out to rest and have their pups on the Island's sand spits which extend to the east and west.

Protection Island NWR also includes an additional 340-acre aquatic lands lease from the Washington Department of Natural Resources. The tideland lease is adjacent to a WDNR reservation that withdraws " . . . the bedlands of navigable water owned by the state of Washington, surrounding Protection Island extending waterward 600 feet from the line of extreme low water . . . from conflicting uses for an indefinite term . . . ." (2)

Protection Island NWR encompasses the entirety of the Island except for a 48-acre section on the west end of the island on Kanem Point, known as the Zella M. Schultz Seabird Sanctuary, which was protected prior to refuge establishment, first through purchase by The Nature Conservancy in 1972, then by the Washington Department of Game (now the Washington State Department of Fish and Wildlife) acquisition in 1974. The seabird sanctuary encompasses approximately half of the Island's rhinoceros auklet and tufted puffin colonies. The Service and WDFW have a Memorandum of Understanding with the primary objective being the protection and enhancement of the wildlife resources on Protection Island. The goal of each agency is compatible and complimentary management (3).

This sign plan is not intended to alter or supersede any sign procedures or policies established by WDFW or the State of Washington. Rather it is intended as guidance to Service personnel in regards to regulatory and interpretive signage within the National Wildlife Refuge portion of Protection Island. Any reference to signs within the Zella M. Schultz Seabird Sanctuary in this document is purely for the purpose of establishing a comprehensive sign inventory and maintenance plan for all of Protection Island. Currently there is only one non-Service sign on the island which is located in the Sanctuary. It is an informational sign with the sanctuary name.

Use and Visitation

Protection Island NWR is not open to the public except for researchers operating under special use permits. The Service maintains a cabin for use by researchers. In addition to contributing to scientific knowledge, research activities serve to satisfy the scientific research and wildlife-oriented education components of the refuge's founding purpose.

A number of people with interest in tracts of land on Protection Island prior to the establishment of the refuge were granted extended use privileges, including island access, under a variety of terms. While most of these terms have already expired, and many of the rest will expire in 2011, there is one lifetime user who maintains a residence on the island. All other current extended users have unimproved lots that receive only occasional use.

The Service also maintains a year-round caretaker's residence. That small cabin is usually occupied by one or two caretakers responsible for overseeing island maintenance, interacting with researchers, and contacting trespassers to provide information about island regulations and wildlife disturbance impacts.

Hazards

Protection Island lies within the Strait of Juan De Fuca, an area known for high winds, strong currents, and rough marine conditions. Although it is closed to the public, on occasion vessels in distress seek shelter within the Island's small protected harbor. In addition, there are a number of

hazardous shoreline areas with submerged rocks and shoals. The island is flanked by two low-lying, partially submerged sand and rock spits, Kanem to the west and Violet to the east. The majority of the island is a large open plateau surrounded by steep unstable bluffs. These bluffs represent a particularly severe hazard for staff, visiting researchers, in-holders, guests, and occasional trespassers.

Regulatory and Entrance Signs

Sign Specification and Mounting Criteria (Regulatory)
Signs will meet the specifications set forth in the Service's Sign Manual (4). Large format signs posted on the island will have wooden posts and supports and will be constructed of high quality, medium density overlay (MDO), ¾ inch plywood except as otherwise indicated. Sign background color will be reflective white and lettering will be black, or, in the case of standard Service signs (small format), dark blue. Text font will be Helvetica Medium. All signs will have the Service reflective shield measuring a minimum of 10" wide by 12" tall except as otherwise indicated.

Large Format Signs
Protection Island shoreline areas will utilize large format signs which can be read unaided from the water at least 200 yards offshore. These signs may also include the national Wildlife Refuge System's Blue Goose logo. Large format signs are at least 6' wide and 4 – 5' high. These signs should be well supported using at least two 4" x 4" posts to protect against high winds common in the area. Examples of signs currently in use:

New version

Old version (still in use)

Small Format, Standard Service "closed area" signs
Standard Service closed area signs may be utilized on a limited case-by-case basis as determined by the Refuge Manager to warn island visitors and residents to avoid specific areas. Such signs will be used sparingly to warn of particularly sensitive habitats or hazards. These signs will be posted on standard galvanized steel or wood posts buried at least 2' deep.

Note: Since the entire island is closed to the public, there is no need to post standard boundary and closed area signs. Furthermore, it would be difficult to maintain such signs in the dynamic shoreline and unstable cliff environment, installing signs would likely have a negative impact on nesting sites, and these small signs would be unreadable from outside of the 200-yard disturbance buffer. Also, the unsigned areas to the north and west side of the island are bounded by hazardous and rocky waters which tend to serve as an approach barrier.

11" X 14"

Special Purpose (Regulatory)
Description: Harbor Entrance, Marina Closed Sign
Material: Heavy polymetal

- Reflective white with blue lettering and red reflective stop sign symbol
- Text: MARINA CLOSED To Public Entry
  To Protect Wildlife Stay 200 Yards From Shore
  U.S. Fish and Wildlife Service
- Dimensions: 42.5" X 25.5"
- Location: Harbor entrance approach
- No Service reflective shield

Sign Specification and Placement Criteria (Information)
There is currently only one information sign on Protection Island, the refuge entrance sign located due west of the harbor (Sign F).

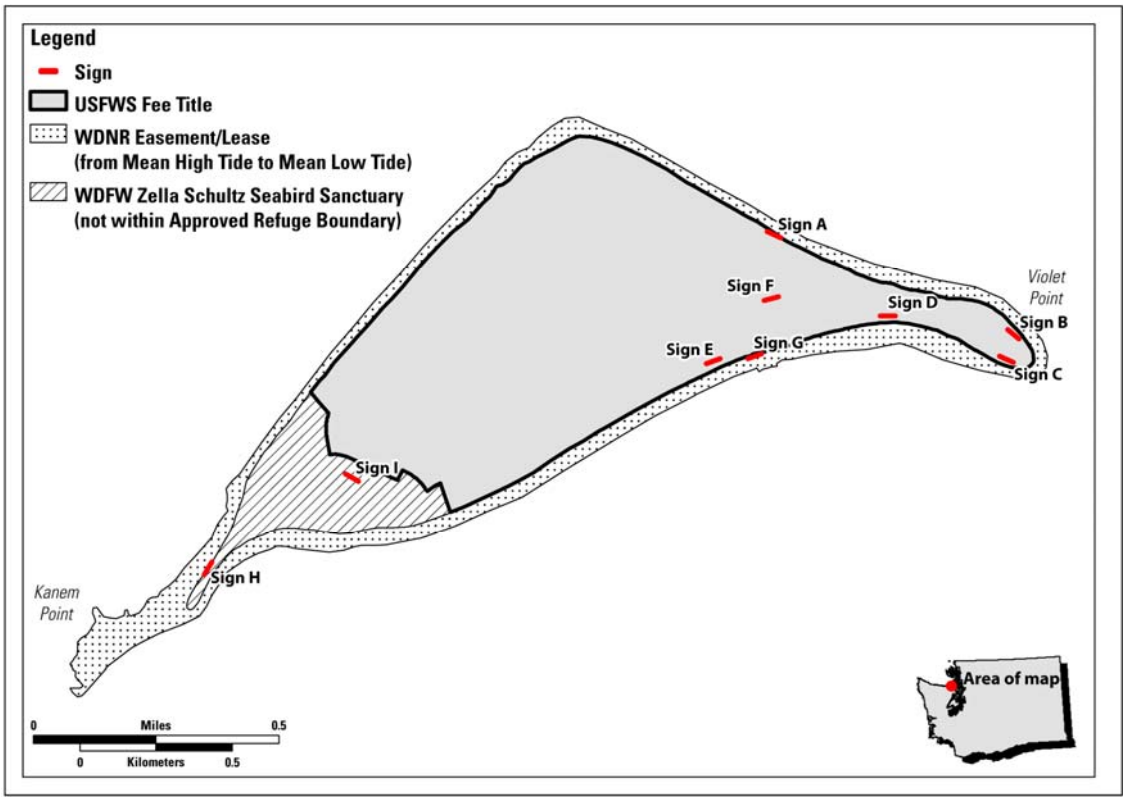
Sign F.
USFWS - Davis

Description: Brown painted background with light blue and green lettering
Material : ¾" MDO plywood

- Picture of puffin
- Text: Protection Island National Wildlife Refuge
  Established August 26, 1988
  U.S. Fish and Wildlife Service
  Department of the Interior
- Dimensions: 6' X 5'
- Location: Approximately 50 yards south west of dock, visible on harbor approach

A. Sign Inventory (entrance and large format regulatory)

Large Format: 6 (signs A – E, H)
Marina Closed: 1 (sign G)
Refuge Entrance: 1 (sign F)
Zella M. Schultz Seabird Sanctuary (WDFW): 1 (sign I)



A.

C.

B.

D.

E.

H.

G. (replaced 4/2009)

I.

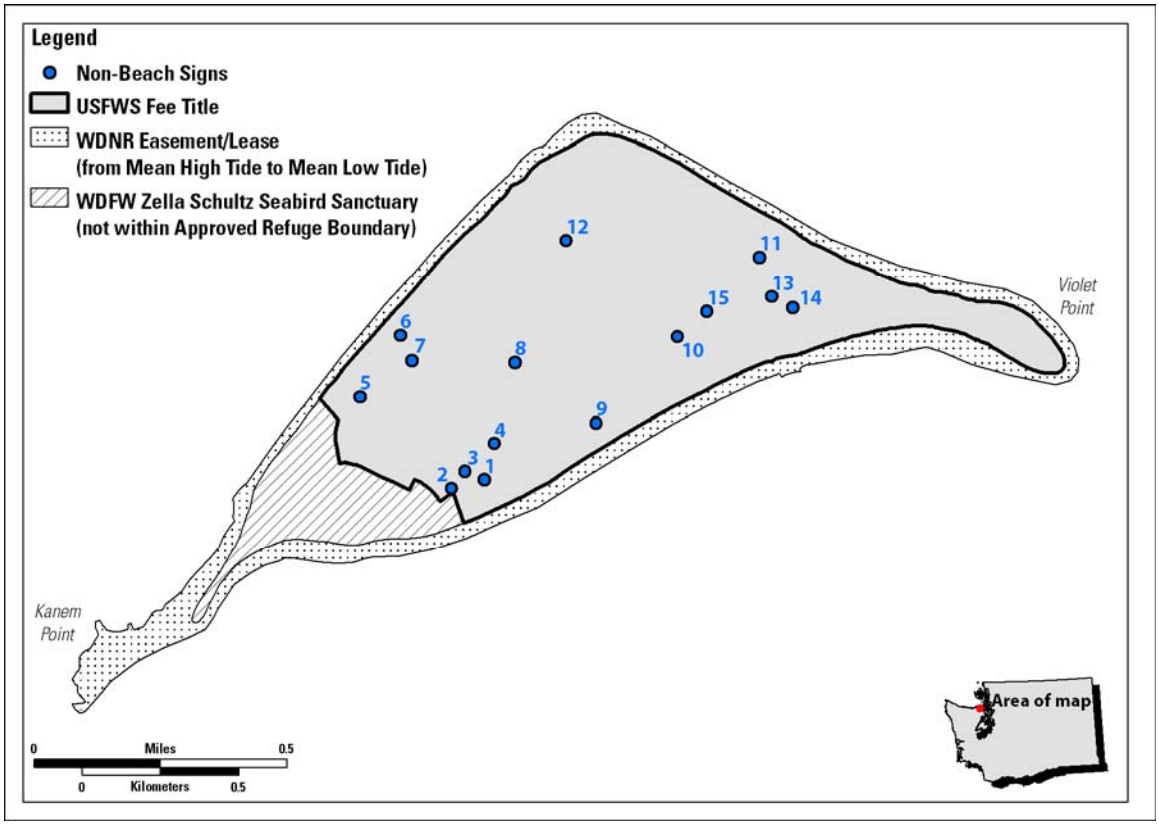
Sign Inventory Table ("entrance" and large format regulator)

Sign designations: A – I
200 Yard: 7 (signs A – E and H)
Entrance: 2, 1 FWS (sign F) and 1 WDFW (sign I)
Harbor Closed: 1 (sign G)

Sign ID / type	Location	Condition	Recommendation	Last Inspection
A, regulatory	North central	Good, decal replaced 8/09	None 3/15/1	0
B, regulatory	Violet Spit North	Sign damaged	Replace sign	3/15/10
C, regulatory	Violet Spit SE	Good, decal replaced 8/09	None 3/151	0
D, regulatory	Violet Spit SW	Good, decal/posts replaced 8/09	None 3/15/1	0
E, regulatory	South central	Good, decal faded	Replace decal	3/15/10
F, information	Marina	Good	None	3/15/10
G, regulatory	Marina entrance	Very Good, new 4/2009	None 3/15/1	0
H, regulatory	Kanem Spit	Good, decal replaced 8/09	None 3/15/1	0
I, information (WDFW sign)	Kanem Spit bluff base	Lettering repainted 2/2010	None (WDFW sign)	3/15/10

B. Sign Inventory (small format regulatory and miscellaneous)

Signs ID Numbers: PI 1 - 15
Area Closed: 12 (signs PI 1 -2, 4 – 13)
Government Property: 1 (sign PI – 3)
Miscellaneous: 1 (Coast and Geodetic Survey Witness Post, sign PI - 15)



Small Format Sign Inventory Table

Sign number	Photo D	escription (Text)	Location, direction	Condition	Last Inspection	Recommendation
PI 1		Area Beyond This Sign Closed All Public Entry Prohibited	150 feet southeast of caretaker cabin facing southeast	Good	3/21/1 0	None
PI 2		Area Beyond This Sign Closed All Public Entry Prohibited	200 ft southwest of caretaker cabin facing west	Worn, faded	3/21/10	Replace

PI 3		Notice Government Property Molesting, Damaging, or Stealing Government Property Is Punishable By Fine And/Or Imprisonment No Trespassing	South side of caretaker shed, faces east	Good 3/21/	1 0	None
PI 4		Area Beyond This Sign Closed All Public Entry Prohibited	Faces southeast	Worn, Faced	3/21/10 Replace	
PI 5		Area Beyond This Sign Closed All Public Entry Prohibited	Faces southwest	Good 3/21/	1 0	None
PI 6		Area Beyond This Sign Closed All Public Entry Prohibited	Faces northeast	Faded 3/21/	1 0	None
PI 7		Area Beyond This Sign Closed All Public Entry Prohibited	Northwest side of abandoned cabin in small wooded area	Faded 3/21/	1 0	Clean
PI 8		Area Beyond This Sign Closed All Public Entry Prohibited	In field 150 feet southwest of Odegard cabin	Worn, Faded, Damaged	3/21/10 Replace	
PI 9		Area Beyond This Sign Closed All Public Entry Prohibited	Faces southwest	Worn, Faded, Post rotten	3/21/10 Replace	sign and post

PI 10		Area Beyond This Sign Closed All Public Entry Prohibited	Southeast side of water tower	Good 3/21/	1	0	None
PI 11		Area Beyond This Sign Closed All Public Entry Prohibited	100 feet from the end of road on Violet bluff, faces north	Good 3/21/	1	0	None
PI 12		Area Beyond This Sign Closed All Public Entry Prohibited	100 feet northwest of Walla Walla cabin, faces northwest	Good 3/21/	1	0	None
PI 13		Area Beyond This Sign Closed All Public Entry Prohibited	At base of Violet bluff on old bluff road, faces northeast.	Faded 3/21/	1	0	None
PI 14	See sign F	Refuge Entrance Sign	West of marina	Good 3/21/	1	0	None
PI 15		Witness Post Please Do Not Disturb Nearby Survey Marker For Information Write To The Director Coast And Geodetic Survey Department Of Commerce Washington D.C. 20230 **(NOT FWS)**	East of water tower	Bent 3/21/	1	0	None

Interpretive Signs

There are currently no interpretive signs on Protection Island National Wildlife Refuge and only one off-refuge interpretive sign, a panel located at John Wayne Marina. However, the Comprehensive Conservation Plan calls for establishing an off-refuge interpretive sign program.

Off-Refuge Interpretive Signs (proposed)

* Locations being considered for interpretive panels:
- John Wayne Marina (replace existing)
- Port Townsend Marina
- Miller Peninsula State Park (a future park plan)

* Specific locations to be determined

Future Interpretive Sign Specification and Placement Criteria (Interpretive)
Material: TBD
Description: Protection Island Interpretive Panel
Text: TBD
Dimensions: TBD

Signs Inspection and Maintenance

Island caretakers will be responsible for routine inspections and maintenance of all signs. Under normal conditions all island signs will be visually inspected on a monthly basis and physically inspected on an annual basis. In addition, caretakers and staff will assess for sign damage as soon after high wind events as possible to insure signs have not been lost or damaged. Any sign damage will be reported immediately to the Refuge Manager or Deputy Manager. Materials necessary to repair signs will be kept on the island in the maintenance building. These materials will include replacement Service shields, posts, cribbing, tools, and bolts. Due to their size and expense, most replacement signs will be stored at the Refuge Complex Headquarters at 715 Holgerson Rd. in Sequim, Washington, or made to order as needed. A review of this sign plan will occur every 5 years unless conditions necessitate an earlier review.

References

1. Protection Island NWR establishing authority: Protection Island National Wildlife Refuge Act, Public Law 977-333, Oct 15, 1982, 96 Stat. 1623

2. Washington Department of Natural Resources, Withdrawal Order 88 017, 1988

3. Memorandum of Understanding regarding Protection Island between WDFW and USFWS, 1995

4. U.S. Fish and Wildlife Service Sign Manual, Director's Memorandum signed by Acting Assistant Regional Director Carolyn Bohan, May 15, 1992, updated 1998

San Juan Islands National Wildlife Refuge

Island, San Juan, Skagit, and Whatcom Counties, Washington

USFWS

Sign Inventory and Maintenance Plan

U.S. Fish and Wildlife Service

August 2010

San Juan Islands National Wildlife Refuge is comprised of 83 rocks, reefs and islands located in the San Juan Archipelago, which lies approximately 85 miles northwest of Seattle, Washington. The archipelago includes 172 islands in an area encompassing about 175 square miles and borders the U.S./Canadian international boundary. The refuge is managed by the U.S. Fish and Wildlife Service as part of the National Wildlife Refuge System.

Most (81 islands) of the San Juan Islands NWR are also designated wilderness and are known as the San Juan Islands Wilderness Area. The only refuge units (islands) that are not designated wilderness are Smith and Minor Islands, Turn Island, and a 2-acre portion of the 135-acre Matia Island.

Note: Many Refuge signs are in poor condition and should be repaired or replaced. There is a pressing need to complete a thorough inspection of all refuge signs and begin a systematic replacement/repair regime. However, such an effort is complicated by the remote nature of the refuge, rugged island terrain, dangerous currents, and short boating season. Maintaining signs on islands is inherently more difficult and more expensive than maintaining signs on the mainland. This is further complicated by wildlife disturbance considerations. The following is intended to be a starting point for the further development of a comprehensive sign inventory and maintenance plan.

Use and Visitation

The area is popular for sightseeing cruises including wildlife viewing, recreational boating, kayaking, diving, and commercial fishing and crabbing. However, only two Refuge islands are open to the public, Matia and Turn. The whole of Turn Island and the 2-acre recreation area on Matia are open year-round. Additionally there is a public trail through the otherwise closed wilderness area on Matia Island. Both islands allow overnight camping in designated sites which are maintained by the Washington State Parks and Recreation Commission (WSPRC). The primary recreational activities on both islands are hiking, wildlife viewing and photography, and camping.

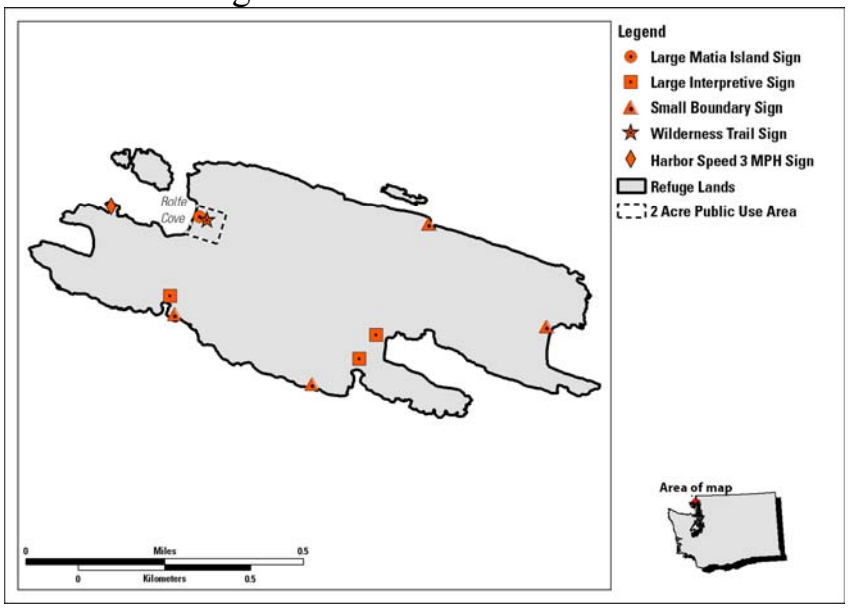
Matia Island is remotely located in the far northeast corner of the archipelago and receives approximately 10,500 visitors annually, while Turn Island is located just outside of busy Friday Harbor, the county seat, and receives approximately 13,500 visitors each year. Although WSPRC maintains most of the infrastructure on these islands, including some signs, an information kiosk on Matia, and camping and restroom facilities, the Service maintains all Service signs.

Public Use Areas

The following maps show sign locations for Matia and Turn Islands. The round symbol shows the location of the Island's "entrance sign" while square symbols represent informational signs.

Triangular symbols represent standard service boundary signs and the star symbol on Matia Island represents the location of the wilderness trailhead sign. In addition, both islands have signs posted and maintained by the WSPRC which are not covered under this plan.

Matia Island Signs



Matia Island "Entrance" sign

Matia Island NW Cove

Matia Is. Wilderness Trailhead (FWS)

Matia Island kiosk (WSPRC)

Turn Island Signs

Turn Island "Entrance" sign

"Entrance" sign and information kiosk

Regulatory Signs

Sign Specification and Placement Criteria (Regulatory)
Signs will meet the specifications set forth in the Service Sign Manual. (1) Signs posted within the refuge will have galvanized or epoxy coated steel or wooden posts and supports and will be constructed of coated steel or high quality, medium density overlay (MDO) ¾ inch plywood, except as otherwise indicated. Sign background color will be white or brown and lettering will be white or black, or, in the case of standard Service signs, dark blue. Text font will be Helvetica Medium. All large plywood signs will have the Service reflective shield measuring a minimum of 10" wide by 12" tall except as otherwise indicated.

Certain sensitive habitat locations such as seabird nesting sites will utilize **large format** signs which can be read unaided from the water at least 200 yards offshore. These signs may also include the National Wildlife Refuge System's Blue Goose Logo. Large format signs are approximately 6' wide and 4 – 5' high. These signs should be well supported to protect against high winds common in the area. There are currently 16 islands with large format signs. Due to

the expense of installing and maintaining large format signs and their visually obtrusive nature, the number of islands with such signs will be reduced to 10 or less in the next 5 years. Each island will be evaluated based on the following criteria; habitat/wildlife sensitivity, marine traffic, and trespassing issues to determine sign needs.

Wilderness Areas

Section 4(b)(2) of The Wilderness Act of 1964 dictates that wilderness areas shall be administered so as to preserve their wilderness character. That includes minimizing non-natural features. The act states no signs will be placed in wilderness areas except those which are determined to be absolutely necessary for effective administration. Where the Refuge Manager determines signs are necessary in wilderness, such as in wildlife areas particularly sensitive to human disturbance, the minimal tool concept will be utilized.

The concept relies on a minimum requirement analysis, which means that when planning necessary actions such as installing signage, management will use the minimum methods needed to accomplish the objective. Staff will develop alternatives and methods that result in minimum impacts and will utilize tools that allow the installation to be accomplished safely with a minimal amount of impairment to the wilderness character.

Standard Service signs modified for island use paired with refuge boundary signs

Standard Service "closed area" signs will be utilized on a limited case-by-case basis as determined by the Refuge Manager to warn visitors to avoid closed and/or hazardous areas. On closed islands, these signs will be replaced with special order signs that read: "Island Closed, No Entry." Such signs will otherwise be the same as the current standard closed area signs and will be used sparingly in wilderness areas to warn of particularly sensitive habitats such as seabird nesting locations. Where practicable these signs will be posted on standard galvanized steel or wood posts buried at least 2' deep. However, island terrain may dictate a different attachment system such as hanging signs with steel chains. When utilizing such systems, installers should insure that the signs cannot turn over or wear against the mounting surface. If "closed area" or "closed island" signs are posted at or near boundaries, these signs will be paired with standard refuge boundary signs. These signs measure 11" x 14".

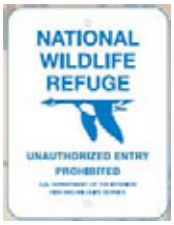
In areas determined to be "wildlife sensitive," such as seabird nesting sites, it is important to maintain a larger disturbance buffer. At such locations the Refuge Manager may elect to install larger signs that can be read from a greater distance. These signs will measure approximately 15" x 20" or 22" x 28". The specific sign size utilized will be determined on a case-by-case basis. See the Wilderness Area section above for more information on installing signs on wilderness

islands while employing the minimal tool concept. In general it is anticipated that the 15" x 20" version will be of adequate size to warn vessels at 200 yards. However, because it is not always practicable to mount signs on the shoreline, it may be necessary to use the larger 22" x 28" versions where signs are installed on the tops or interiors of islands.

Sign Specification and Placement Criteria (Regulatory)
Description: Closed area, Island Closed, Refuge Boundary
Material: Coated metal
Text:
- Closed Area (Standard): Area Beyond This Sign Closed, All Public Entry Prohibited
- Island Closed (Modified): Island Closed, No Entry, All Public Entry Prohibited
- Refuge Boundary (Standard): National Wildlife Refuge, Unauthorized Entry Prohibited, U.S. Department of the Interior, Fish and Wildlife Service

Color: Blue text on white background
Dimensions: 11" X 14"
Placement criteria for "closed area" and "island closed" signs: used in closed areas and/or hazardous locations closed by refuge management adjacent to public access areas.

Note: In general, when posted on a refuge boundary these signs will be mounted directly below a standard "NWR Boundary" sign.
Placement criteria for boundary signs: used at refuge boundaries in non-wilderness areas.
Spacing: Generally not more than ¼ mile distance between signs on a continuous boundary. However, terrain may dictate the need for additional signs. On small islands it may be sufficient to install a single post with signs facing in opposite directions.



Special Purpose (Regulatory)
Description: Large format
Material: High quality ¾" MDO plywood
Text:
- Current: National Wildlife Refuge, To Protect Wildlife Stay Away 200 Yards
- Replacement: National Wildlife Refuge, Island Closed, Keep Off 200 Yards to Protect Wildlife

Color: White or brown background, blue and black text
Dimensions: 6' X 4 – 5'
Location: Wildlife disturbance sensitive areas

Interpretive Signs

There are currently no truly interpretive signs in the San Juan Islands National Wildlife Refuge, although some signs do provide general information. However, the Comprehensive Conservation Plan calls for establishing an interpretive sign program.

Future on-refuge interpretive signs (proposed)

- Matia Island, 1 refuge-wide panel, up to 3 island specific signs
  Locations being considered: Rolfe cove, both ends of the wilderness trail
- Turn Island, up to 3 refuge-wide panels, up to 5 island specific signs
  Locations being considered: West beach adjacent to mooring area, both ends of the outer loop trail, and various locations along the loop trail and camping area

Future off-refuge interpretive signs

Locations being considered for interpretive panels:

San Juan Islands locations
Friday Harbor, Roche Harbor, Lopez Island (2), Orcas Island, and Shaw Island

Mainland locations
Bellingham and Anacortes

General Information Signs

Sign Specification and Placement Criteria
Material: Wood, ¾" MDO plywood
Description: Matia and Turn Island identifying signs

Text:

- Matia Island
- Turn Island

- Matia Island Wilderness Trail, This one mile loop takes you through the old growth forest of the Matia Island wilderness, Please Stay On The Trail, No Pets Allowed

Sign Inventory

#15 Hall Island

#15 Hall Island

#68 Bird (Rock) Island

#78 Puffin Island

#81 Williamson Island (Rocks)

San Juan IslandsNWR Sign Inventory 2007 (the most recent comprehensive survey)

#	Island Name	Signs and Condition	Recommendations
1	Small Island	3 signs on 1 post -- blue goose, wilderness (faces North). Signs face North and South. All Faded.	Replace all signs
2A	Rum & Rim Islands	No signs on North island.	None
2B	Rum & Rim Islands	No signs on South island.	None
3	Fortress Island	Signs on East side - 3 on chain; South side- 3 on chain (boundary, blue goose, closure). All signs faded.	Replace all signs
4	Skull Island	1 boundary, 1 wilderness sign -- both on same post, both down. Post on East side.	Replace and repair all signs except wilderness
5	Crab Island	No sign.	None
6	Boulder Island	North side - blue goose, wilderness signs on chain. Faded.	Replace all signs
7	Davidson Rock	Under water, no signs.	None
8	Castle Island	Area closed, wilderness signs on West side. Faded wilderness, OK condition for closure sign. Area closed sign on North side behind grass, falling down on post. East side has 3 signs on chain - faded blue goose, closure, boundary.	Replace and repair all signs
9	Blind Islands	3 signs on chain on South side, turned over. Unable to read.	Replace all signs
10	Aleck Rocks	No signs.	None
11	Swirl Island	3 signs on chain on North side, 2 flipped and 3rd is faded; sign frame on top is down	Replace and repair all signs
12	Unnamed Rock	No signs.	None
13	Unnamed	North island has "Private Property" sign. Possible former sign on South side is fallen or in grass? SURVEY required on North island because island is signed "PRIVATE" and connected to mainland.	Replace and repair all signs Survey island
14	Unnamed No	signs.	None
15	Hall Island	Large sign on North is on side, fallen flat.	Replace and repair all signs
16	Unnamed No	signs.	None
17	Secar Rock	No signs.	None
18	Unnamed No	signs.	None
19	Unnamed No	signs.	None
20	Unnamed No	signs.	None
21	Mummy Rocks	No signs.	None

#	Island Name	Signs and Condition	Recommendations
22	Unnamed No	signs.	None
23	Shark Reef	No signs.	None
24	Harbor Rock	No signs.	None
25	North Pacific Rock	No signs.	None
26	Halftide Rocks	No signs.	None
27	Unnamed No	signs.	None
28	Low Island	2 large format come together in triangle (back to back). 2 small signs facing East and West on 1 post chained to ground. Blue goose on top, wilderness on bottom (faded out completely).	Replace all signs except wilderness
29	Pole Island	Large "Slow - No wake" signs on both sides.	None
30	Barren Island	Large format sign chained down faces South, needs new decal. 2 signs on post - faded, face East.	Replace all signs or decals
31	Battleship Island	2 Large format signs chained down to ground. Need new decals and are faded. 2 signs on chain on West including blue goose. 2 additional signs - 1 turned. 2 signs faded out.	Replace all signs or decals
32	Sentinel Rock	No signs.	None
33	Center Reef	No signs. No day beacon.	None
34	Gull Reef	No signs.	None
35	Ripple Island	1) Large format sign. Needs new decal. 3 signs in overgrown area on post. Blue goose, closure, boundary. Sign on West side by beach.	Replace all signs or decals
36	Unnamed (Shag Reef)	No signs.	None
37	Unnamed (Little Cactus Island)	Metal sign on post lying flat on ground. Used to be on high point.	Replace and repair all signs
38	Gull Rock	Small sign at East side beach. Blue goose and closure. Large format sign. 3 signs on chain on South finger - Blue goose, wilderness, closure.	Replace all signs or decals except wilderness
39	Flattop Island	3 signs on chain, faded; boundary at bottom, then closed area and blue goose. 2 Large format signs, 1 facing NE and 1 facing W – both need replacing.	Replace all signs or decals
40	White Rocks	No signs.	None
41	Mouatt Reef	No signs. Underwater.	None
42	Skipjack Island	Light on NW end. 2 Large format older signs, 1 facing SW, 1 facing E. Both need new decals. 3 small signs on chain. All faded.	Replace all signs or decals

#	Island Name	Signs and Condition	Recommendations
43	Unnamed No	signs.	None
44	Clements Reef	No signs. Buoy to W of reef.	None
45	Unnamed	No signs. Danger daymark to E.	None
46	Parker Reef	No signs. Light & daymark on reef.	None
47	The Sisters	Large format sign facing NW. Newer sign, needs new decal. 3 signs on chain. All turned around. Light.	Replace all signs or decals
48	Unnamed	Sign on chain facing W. Turned. 2 Signs on chain facing N, turned around.	Replace all signs
49	Unnamed	No signs. Navigation aid. Wasp Passage Light. Made of wood.	None
50	Tift Rocks	3 signs on post. The only readable sign Is Area Closed. Top and bottom signs faded.	Replace all signs
51	Reef Point	No signs.	None
52	Turn Rock	No signs. USCG channel marker #3 Light/daymark	None
53	Shag Rock	No signs. Daymark/daybeacon	None
54	Flower Island	3 signs on chain west side, bottom is boundary, middle is closed area, top is blue goose boundary. All faded.	Replace all signs
55	Willow Island	W - 3 signs on chain, faded, turned. E- sign on post on ground. Can't see text.	Replace and repair all signs
56	Lawson Rock	No signs. Underwater. Navigation Aid.	None
57	Pointer Island	No signs.	None
58	Black Rock	No signs. Navigation aid.	None
59	Spindle Rock	No signs. Daybeacon.	None
60	Brown Rock	2 signs. Both faded. Blue goose & Wilderness.	Replace all signs
61	Unnamed No	signs.	None
62	South Peapod Rock	Old large format.	Replace decal
63	Peapod Rocks	No signs.	None
64	North Peapod Rock	Old style large format sign. Faded. 3 signs on chain, blue goose, wilderness, closed area. All in OK condition.	Replace all signs and decals
65	Eliza Rock	No signs. Junction light/daymark.	None
66	Viti Rocks	Large format sign. Needs new decals. Small sign turned on channel.	Replace all signs and decals
68	Bird Rock	No sign. Bird Rock Light and Danger Rock daymark.	None
69	Unnamed No	signs.	None
70	Low Island	Area closed sign on N. Fallen down. 2 signs on 1 post facing N, blue goose and wilderness. Good condition.	Replace and repair bad signs except wilderness

#	Island Name	Signs and Condition	Recommendations
71	Nob Island	Sign on small island on post on ground. On big island - 2 signs on chain, blue goose on top, Area closed on bottom. Area closed sign turned around.	Replace all signs
72	Unnamed No	signs.	None
73	Unnamed	Blue goose and wilderness signs faded and facing W and falling down to NE. Signs located on W tip of island.	Replace and repair all signs except wilderness
74	Unnamed No	signs.	None
75	Smith Island		Inventory
76	Minor Island		Inventory
77	Matia Island	3 Interpretive signs (Matia Island, rules, WSPRC). 4 Small faded signs - can't read.	Remove faded signs
78	Puffin Island	3 faded small signs on chain. 2) Old large format sign faces S. Needs new decal. facing S. Light/daymark.	Replace all signs and decals
79	Turn Island	6 small faded signs. Large Turn Island interpretive sign, Dogs on leash sign, Take it in/Take it out signs in good condition. Harbor speed sign. Small sign facing E faded.	Replace all bad signs
80	Bird Rocks	Large format brown sign facing E located on 2nd rock from S. Small signs on S rock.	Replace all signs and decals
81	Williamson Rocks	Large format sign. 2 small signs on 1 post.	Replace all signs and decals
82	Colville Island	2 small signs, blue goose and closed area on post on E rock, placed at 90 degree angles. Small unreadable sign over closed area sign on SE side of W rock. Both on 1 post. Small blue goose sign over closed area sign on SW side of W rock. Both on 1 post. Large format sign on E side of W rock. Good condition. Turned from original angle to SE (was facing NE).	Replace and repair all signs
83	Buck Island	No signs.	None
84	Bare Island	Old large format sign on SW. Needs new decal. 3 signs on chain. All turned.	Replace all signs and decals

Sign Inspection and Maintenance

All signs will be visually inspected on an annual basis using. In addition, volunteers and staff will assess for sign damage as soon after high wind events as possible to insure signs have not been lost or damaged. Any sign damage will be reported immediately to the Refuge Manager or Deputy Manager. Materials necessary to repair signs will be stored at the Refuge Complex Headquarters at 715 Holgerson Rd. in Sequim, Washington, or made to order as needed. These materials will include replacement Service shields, posts, cribbing, tools, and bolts. Due to their size and expense, most large format replacement signs will be manufactured as needed. A review of this sign plan will occur every 5 years unless conditions necessitate an earlier review.

References

1. U.S. Fish and Wildlife Service Sign Manual, Director's Memorandum signed by Acting Assistant Regional Director Carolyn Bohan, May 15, 1992, updated 1998